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ABSTRACT

This teacher handbook provides recommended goals and objectives and suggested measures for competency-based courses in the vocational program area of agricultural education. A background and overview section contains the philosophy and rationale, discusses thinking skills and programs for exceptional children, and provides notes that explain how to read the goals, objectives, and measures and offer suggestions for student placement, textbook use, and activities. This specific information is then provided for a vocational education competency-based curriculum: purpose and overview (target groups, philosophy, curriculum planning and design) and course of study. For agricultural education, grades 9-12, are offered a program description, learning outcomes, and scope and sequence. These courses are included in the curriculum: agricultural machinery/equipment/structures I-III, agricultural production I-III, forestry I-III, homestead and gardening skills, introduction to agriculture/natural resources, natural resources and environmental protection I-III, and ornamental horticulture I-III. Materials provided for each course include a topical outline and a one-page format for each competency goal that details grade level, skills/subject area, the competency goal, objective(s), and measure(s) (suggestions of ways in which students may demonstrate their ability to meet the objective). (YLB)

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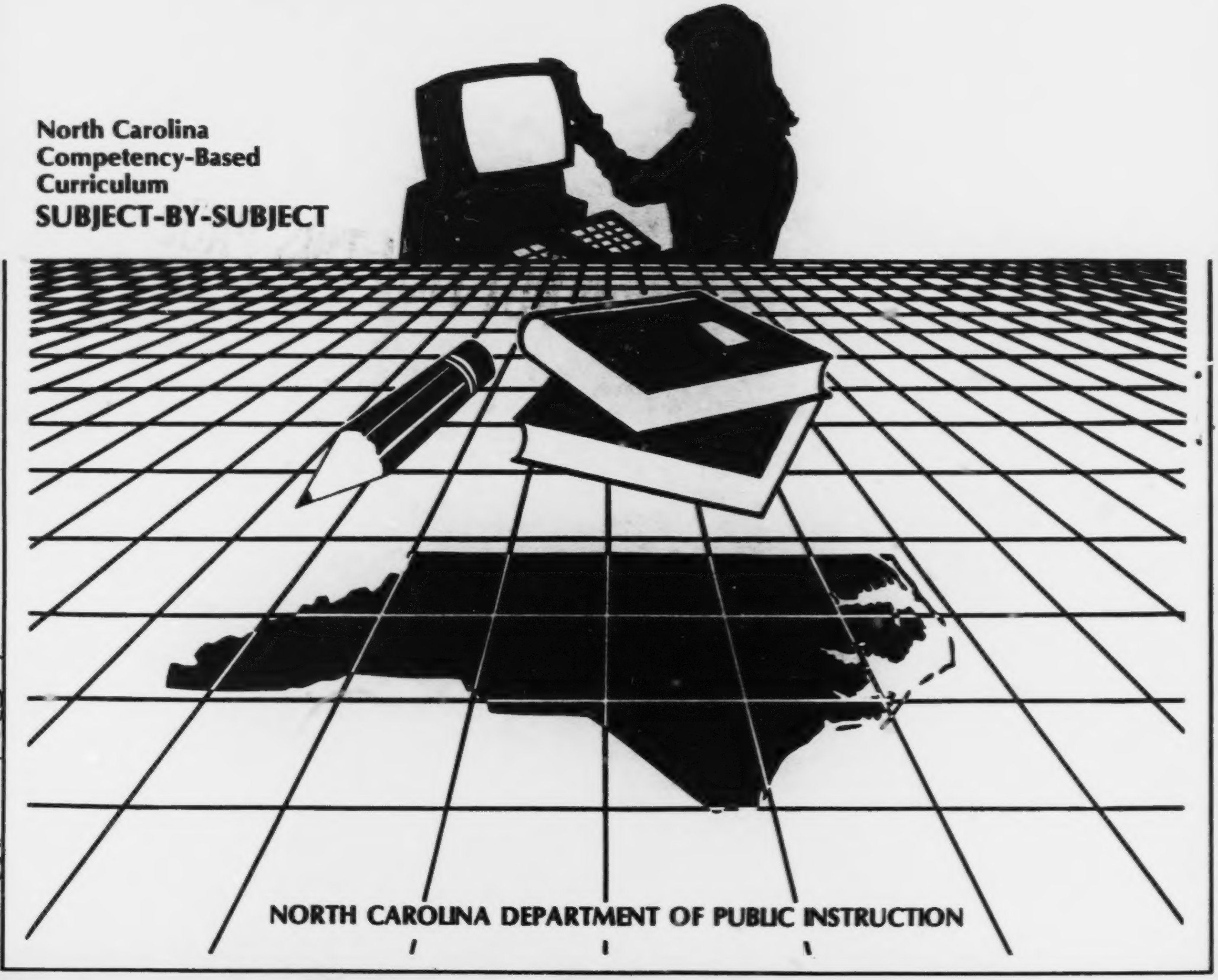
TEACHER HANDBOOK
AGRICULTURAL EDUCATION
VOCATIONAL EDUCATION

North Carolina
Competency-Based
Curriculum
SUBJECT-BY-SUBJECT



NORTH CAROLINA DEPARTMENT OF PUBLIC INSTRUCTION

CE044257

TEACHER HANDBOOK

VOCATIONAL EDUCATION

AGRICULTURAL EDUCATION

GRADES 9-12

North Carolina Competency-Based Curriculum

Division of Vocational Education
Instructional Services
North Carolina Department of Public Instruction

Raleigh, North Carolina
1985

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Foreword

As a result of the Elementary and Secondary School Reform Act of 1984 and the appropriation which accompanied this act, the North Carolina State Department of Public Instruction engaged in an extensive audit and revision of curriculum throughout the summer and fall of 1984. The products of this work, the North Carolina Standard Course of Study and the Teacher Handbook for the competency-based curriculum, provide a detailed, integrated basic course of study for all subjects at all grade levels.

The North Carolina General Assembly has also made a commitment to the development of a basic education program. This program includes the staffing and material support needed for the full implementation of the North Carolina Standard Course of Study and the competency-based curriculum in all public schools throughout the State. The financial support of the General Assembly and the work of educators throughout the State in developing the competency-based curriculum are important contributions to our continuing efforts to provide a quality education for every child residing in North Carolina.

A. Craig Phillips
State Superintendent of Public Instruction

Acknowledgements

The Instructional Services Area of the Department of Public Instruction acknowledges with gratitude the outstanding cooperation and assistance we have received from individuals and groups throughout the State of North Carolina. Without such cooperation, the development and printing of the North Carolina Standard Course of Study and the Teacher Handbook for the competency-based curriculum would not have been possible.

We wish to express a special thanks to:

- the North Carolina General Assembly for providing the funds to make this important work possible,
- more than 8000 local educators who participated in the writing of the documents and in reacting to early drafts,
- almost 300 persons from institutions of higher education who advised the staff and assisted in the development of the curriculum,
- Raleigh-based and regional staff in the Divisions of Arts Education, Communication Skills, Computer Services, Exceptional Children, Healthful Living, School Media Programs, Mathematics, Science, Social Studies, Student Services, and Vocational Education. These Public Instruction staff members carried the primary responsibility for planning, writing, and editing the curriculum.
- the Controller's Office in the Department of Education for excellent assistance in designing a computer program for storing and printing the Standard Course of Study and the competency-based curriculum,
- the Division of School-Community Relations for technical assistance in the publication of the documents,
- all areas of the Department of Public Instruction for their encouragement and invaluable assistance in numerous ways,
- Kay Barbour and Janice Royster who word-processed the entire 8000 pages, and
- especially Dr. Barbara Holland Chapman who coordinated the development of the Standard Course of Study and the competency-based curriculum. Her untiring efforts have contributed significantly to the quality of these documents.

The involvement of the entire education community in the writing of the curriculum truly makes it a North Carolina curriculum of which the State can be justifiably proud. We look forward in the coming years to working with all of you in revising and improving the competency-based curriculum in order that it will continue to meet the needs of the children of North Carolina.

Joseph B. Webb

Joseph B. Webb
Assistant State Superintendent
Instructional Services

BACKGROUND AND OVERVIEW

Introduction

Immediately following the passage of the Elementary and Secondary Reform Act in June of 1984, the area of Instructional Services within the North Carolina State Department of Public Instruction began a revision of the North Carolina Standard Course of Study and the development of the Teacher Handbook for the competency-based curriculum. These efforts represent a significant part of the development of a basic education program for North Carolina's Public Schools.

Three publications hold the results of our efforts to define a basic education program for the State: The Basic Education Program for North Carolina's Public Schools, North Carolina Standard Course of Study, and the Teacher Handbook for the competency-based curriculum. The Basic Education Program for North Carolina's Public Schools outlines the curriculum, programs not confined to subject areas, general standards, material support, and staffing which should be provided in all schools throughout the State. The North Carolina Standard Course of Study, adopted by the State Board of Education, provides an overview of the basic curriculum which should be made available to every child in the public schools of our State. It includes the subject or skills areas of arts education, communication skills, guidance, healthful living, library/media skills, mathematics, science, second language studies, social studies, and vocational education as well as the philosophy and rationale underlying the curriculum and considerations which should be made in developing thinking skills and providing for the needs of exceptional children. The Teacher Handbook for the competency-based curriculum provides recommended goals and objectives and suggested measures for each subject or skills area.

The first step taken in auditing and refining the curriculum in each subject or skills area was to review and synthesize the reports of curriculum review committees and the work contained in two earlier publications (Course of Study for Elementary and Secondary Schools K-12 and Competency Goals and Performance Indicators). The next step was to involve educators from local education agencies and institutions of higher education in working with the North Carolina Department of Public Instruction staff to expand and refine the curriculum. Thousands of persons throughout the State have been involved in the development of the North Carolina Standard Course of Study and the Teacher Handbook for the competency-based curriculum.

Three important points should be kept in mind when reviewing these documents. First, while the curriculum represents the standard course of study which should be available to all children in North Carolina Public schools, many public schools in the State presently offer an even more comprehensive curriculum. Second, the standard course of study includes the curriculum that should be made available to every child, not what every child is actually required to take. Required subjects or courses are outlined in the appendices.

Third, the North Carolina Standard Course of Study and the Teacher Handbook for the competency-based curriculum will never actually be completed. Several steps have been taken to insure that the curriculum may be constantly updated: the documents have been entered on an IBM 5520 computer word-processing program for ease of revision and updating; the competency-based curriculum has been produced in loose-leaf form so that revised or additional pages may easily be added; and included in each document is the name of a contact person within the State Department of Public Instruction to whom staff in local education agencies or others may send suggestions for additions or revisions (Appendix I). As with any viable curriculum, these documents must be constantly open to review, expansion, and revision in order that they continue to meet the needs of the children of the State of North Carolina.

Philosophy and Rationale

The philosophy and rationale underlying the North Carolina Standard Course of Study and the Teacher Handbook for the competency-based curriculum imply a context in which the curriculum will be implemented. What follows are definitions of the purposes for which the curriculum was developed and the principles incorporated into its development as well as descriptions of who will implement it and where it will be successfully implemented.

Purposes and Principles

The primary purposes of the North Carolina Standard Course of Study and the competency-based curriculum are (1) to help students become responsible, productive citizens and (2) to help students achieve a sense of personal fulfillment. It is clear that there are competencies which a student must develop in order to meet both of these purposes.

Students must develop the specific competencies needed to gain employment or continue their education. These competencies include critical thinking skills, skills with media and technology, and the basic content knowledge provided within a core curriculum (arts education, communication skills, healthful living, mathematics, science, second language studies, social studies, and vocational education).

Students must develop the skills and attitudes necessary to cope with contemporary society. Among these are a positive attitude toward oneself, a sense of independence and responsibility for oneself, an understanding of oneself and one's own culture, a positive attitude toward others including those who come from different cultures, a respect for the rights of others, a sensitivity to the needs and feelings of others, a sense of responsibility to others, a willingness to cooperate with others in working toward a common goal, and the ability to understand and cope with a constantly changing society.

In order to help students become responsible, productive citizens who have a sense of personal fulfillment, commonly accepted principles of learning have been incorporated into the North Carolina Standard Course of Study and the Teacher Handbook for the competency-based curriculum. One of these principles is the importance of integrating the curriculum--of emphasizing the understanding of concepts and processes over the mere acquisition of isolated facts. Stressing the mastery of integrated knowledge helps students to move from what is known to an understanding of the unknown, to see relationships and patterns and begin to make generalizations, to understand the interrelatedness of the subject areas and skills areas, and to succeed in learning. An integrated curriculum helps students learn how to learn.

Another principle considered in the development of the North Carolina Standard Course of Study and the Teacher Handbook for the competency-based curriculum is that learners are more likely to attempt those tasks at which they feel they can succeed and which are relevant to their lives. If students are to be successful in school and if they are to pursue lifelong learning, they must see learning as worthwhile. The competency-based curriculum is, therefore, a program of continuous learning based upon the individual student's needs, interests, and stages of development. The curriculum provides opportunities for the student to develop self-expression, to learn to communicate effectively, to maintain and develop both physical and emotional health, to choose among curriculum electives, and to become an active participant in the learning process. The importance of personalizing the curriculum to help each student reach her/his maximum potential is stressed.

Effective Teachers

It is the classroom teacher at each grade level or in each subject area who has the most direct influence on the implementation of the North Carolina Standard Course of Study and the competency-based curriculum. The ultimate task of integrating the curriculum must be performed by the classroom teacher through preparation for instruction and presentation of content. Student success in learning is assured when teachers use the information gained through monitoring and evaluation to determine appropriate instructional tasks and to provide appropriate feedback to students. What the teacher presents and how the teacher presents it determines whether students feel the task is relevant to their lives. The teacher's efficient management of instructional time and student behavior are also important to the successful implementation of the curriculum in each classroom.

Effective Schools

Several common characteristics will be present in the schools which most effectively implement the North Carolina Standard Course of Study and the competency-based curriculum. These characteristics include strong instructional and administrative leadership by the principal of the school, dedicated and qualified teachers, an emphasis on curriculum and instruction, a positive school climate, ongoing evaluation based on student achievement, and good home/school relations. Strong instructional and administrative leadership by the principal means that the principal functions as the instructional leader, supports instructional effectiveness by the way in which the school is managed, and clearly communicates the school's mission to staff, students, and parents. Dedicated and qualified teachers care about their students, understand and support school-wide goals and procedures, work as a team, exhibit positive morale and enthusiasm for their work, and demonstrate their good training through application of the skills involved in quality teaching. An emphasis on curriculum and instruction includes clearly stated school-wide goals and objectives, structured staff development based on the school's goals, curriculum continuity (alignment among school-wide goals, instructional approaches, materials used, and the assessment of students' needs, abilities, and interests), and a high percentage of student time-on-task. Elements of a positive school climate are a safe and orderly environment, a perceptible feeling of pride and school spirit in all that the school does, the communication of high academic and social expectations to students, and opportunities for student responsibility and involvement. Ongoing evaluation based on student achievement begins with early identification of students' needs, abilities, and interests, includes frequent monitoring of student progress in multiple ways (teacher observation, classroom activities, homework, teacher-made tests, mastery skills checklists, criterion-referenced tests), and results in appropriate instructional prescriptions to improve individual student performance and the school-wide instructional program. Good home/school relations are the outgrowth of effective, positive communication between the school and the home. This includes encouraging parents to help their children at home, making them feel they are appreciated by the school staff, and letting them know they are welcome in the school and have a part to play in school affairs. Good home/school relations increase parents' support of the school's instructional goals and disciplinary policies.

The characteristics described above will be found in the elementary, middle/junior high, and high schools which most effectively implement the North Carolina Standard Course of Study and the competency-based curriculum. However, in each of these schools consideration must be given to the unique development needs--intellectual, physical, social, and emotional--of the students served. For example, the need of young children for concrete, hands-on experiences; the need of middle school children for transitional experiences in curriculum choices, scheduling, and conseling; and the need of high school students for the variety of curriculum choices provided by the comprehensive high school.

The North Carolina Standard Course of Study and the competency-based curriculum represent a comprehensive, integrated course of study; however no document by itself has ever made the ultimate difference in the quality of education which children receive. Principals who function as instructional leaders and teachers who make use of their most effective teaching skills will appropriately implement the competency-based curriculum and thus insure that the children of North Carolina receive a quality education.

Thinking Skills

In order to become productive, responsible citizens and to achieve a sense of personal fulfillment, students must develop the ability to think. Thinking skills should be developed and reinforced throughout the curriculum and during every activity of the school day. It is also important that students be helped to apply these skills to "real life" situations outside the school.

The most frequently used system for classifying thinking skills is Bloom's (1956) Taxonomy. This system, with adaptations made by Sanders (1966) and Soar et al. (1969), was used in the integration of thinking skills throughout the Teacher Handbook for the competency-based curriculum. These skills fall into seven broad categories--memory, translation, interpretation, application, analysis, synthesis, and evaluation.

The most basic thinking skills are memory and translation. Memory involves the ability to remember specific pieces of information or facts such as names, dates, events, and rules. Translation requires the student to remember specifics and to understand or express them in her/his own terms. One example of a translation skill is the student's ability to restate a classroom rule in her/his own words. Another example is the ability to read the mathematical symbol "+" as "plus".

Remembering isolated bits of information or even restating that information in one's own words does not necessarily require reasoning on the part of the student. Higher-level thinking skills are defined as those processes which require thinking or reasoning above the levels of memory or translation--interpretation, application, analysis, synthesis, and evaluation.

Students begin to demonstrate their ability to reason through interpreting information, applying what is learned in one situation to a new situation, and analyzing information. Ways in which a student might demonstrate the ability to interpret information are to list the similarities and differences between two or more objects or to tell why a particular classroom rule was established. A student demonstrates a degree of ability in the category of application when s/he is able to explain how the principle of representative government at the state and federal levels may apply to the election of officers to the student council. A student who reads a newspaper editorial and is able to distinguish fact from opinion, point out unstated assumptions, and recognize bias is demonstrating skills of analysis.

When students apply skills of analysis, they are taking apart a whole. When students apply synthesis skills, they are creating a whole that is unique or new to them. Synthesis is usually equated with creativity. Composing a song, building a model house, or formulating a hypothesis during a science experiment are examples of synthesis activities.

Evaluation is distinct from opinion in that evaluation is the conscious making of judgments based on evidence or criteria. Opinion is usually formed from an emotional or affective base. Students serving as jurors during a simulated trial are using evaluation skills or making judgments based on evidence. Students critiquing one another's writing based on established elements of style are using evaluation skills or making judgments based on criteria.

To insure that students develop higher-level thinking skills they should be guided in the use of these skills in each subject area at each grade level and in their application to "real life" situations. When developing lesson plans, teachers should prepare tasks and questions at a variety of cognitive levels. However, strict adherence to previously prepared questions may inhibit rather than enhance a class discussion. Furthermore, it is often difficult to think of appropriately worded higher-level questions in the midst of a good classroom discussion. The following simple strategies will lead to the asking of higher-level questions and the giving of higher-level responses:

1. Before starting an activity, explain to the learner what you are going to do.
2. Before starting an activity, give the learner time to familiarize her/himself with the materials.
3. Ask questions which require multiple word answers.
   (e.g., "Why did he choose that path?")
4. Ask questions which have more than one correct answer.
   (e.g., "What things make people happy?")
5. Encourage the learner to enlarge upon her/his answer.
   (e.g., "Tell us more about that.")
6. Get the learner to make judgments on the basis of evidence rather than by guessing.
   (e.g., "You said . . . Read the line in the book that made you think that.")
7. Give the learner time to think about the problem; don't be too quick to help.
   (e.g., Wait at least five seconds before prompting or asking another question.)
8. Get the learner to ask questions.
   (e.g., "If the astronaut were in our classroom, what questions would you ask her?")
9. Praise the learner when s/he does well or takes small steps in the right direction.
10. Let the learner know when her/his answer or work is wrong, but do so in a positive or neutral manner. (Desirable Teaching Behavior Task Force, 1976)

The following are examples of two levels of activities (K-1 and above K-1) within the seven categories of thinking skills and two categories of questions or statements (affectivity and procedure) outside the seven categories of thinking skills:

Florida Taxonomy of Cognitive Behavior--K-1 Form (Soar et al., 1969)

1. Memory--items at this level are intended to represent no activity other than rote memory. The pupil is expected to give back an idea in the same form it was given, without changing the nature of the idea or the form in which it was expressed.

   a. repeats from memory
   b. repeats other
   c. repeats in sequence
   d. choral response
   e. spells
   f. gives/receives information
   g. seeks information

2. Translation--the intent of this category is to identify pupil activities involved in changing the form in which an idea is expressed, but not in changing or manipulating the idea itself.

   a. sounds letters
   b. names pictures, objects, colors, letters
   c. copies letter, number, work (learned)
   d. gives/follows directions
   e. describes situation, event
   f. reports experience (2+ thoughts)
   g. describes situation, event
   h. recognizes word (sight words)
   i. translates one language into another or vice versa (e.g., math symbols into words or Spanish into English)
   j. asks/gives permission
   k. puts into own words

3. Interpretation--the activities in this category are those of making comparisons, identifying similarities or differences, identifying relatedness, or carrying out a process in which the child has previously been instructed, when told that the process is appropriate.

   a. sounds out word
   b. classifies (1 attribute)
   c. counts
   d. adds/subtracts
   e. uses units, tens
   f. compares letters, numbers
   g. copies letters(s), number(s)--learning
   h. gives class name (vehicle, etc.)
   i. identifies similarities, differences
   j. asks/gives reason (opinion)
   k. names sensation
   l. performs learned task or process
   m. relates terms (e.g., 1/first, little/small, purple/violet/lavender)
   n. makes comparisons
   o. describes what may be seen to be happening in a picture

4. Application--one of the central aspects of application is that the student is able to select from past learning that which is appropriate for the current situation, and apply it. In interpretation a process was carried out when specified, but here the pupil must decide her/himself what process should be applied. Organization and the interrelationships between two or more ideas are central.

    a. classification (2+ attributes)
    b. directs learning game
    c. creates arithmetic problem
    d. writes/types sentence
    e. asks/tells who, what, or where
    f. seriates (alphabetizes)
    g. applies previous learning to new situation
    h. reads (thought unit)
    i. selects and carries out process

5. Analysis--the central elements in this category are those of inferring causation, motivation, or feelings from information given about the setting and the behavior of the people involved, or of identifying information which supports a conclusion, or establishing the accuracy of a process. The selection and use of relevant supporting data is the central process.

    a. verifies equation balance
    b. infers feeling or motive
    c. infers causality (tells why)
    d. cites evidence for conclusions

6. Synthesis--the central idea of the synthesis category is that the child organize ideas in a way that is new to her/him, or projects probable consequences of a given behavior, or formulates a plan or set of rules to deal with anticipated difficulties, or produces something which is new to her/him.

    a. elaborates on picture or story
    b. proposes plan or rule
    c. play-acts
    d. makes up story
    e. makes fantasied object (e.g., sand or clay)
    f. makes common object (e.g., sand or clay)
    g. draws/colors common object
    h. draws/colors fantasied object
    i. makes predictions based on available facts

7. Evaluation--the central concept of evaluation is that there must exist a set of standards or criteria against which behavior or some sort of product is compared.

    a. compares with criteria or rule
    b. compares with plan

Florida Taxonomy of Cognitive Behavior (Brown et al., 1968)

1. Knowledge (memory)

1.1 Knowledge of Specifics--requires the memorization of information or knowledge which can be isolated or remembered separately, the smallest meaningful bits.

a. reads
b. spells
c. identifies something by name
d. defines meaning of term
e. gives a specific fact
f. tells about an event

1.2 Knowledge of Ways & Means of Dealing with Specifics--requires knowledge about the manner in which specific information is handled--the ways of organizing, working, and evaluating ideas and phenomena which form the connecting links between specifics. It does not require the learner to deal actually with the specifics her/himself, but rather to know of their existence and possible use. Thus, s/he may be expected to state a previously encountered principle or generalization, but not to develop one. The items which belong to this category refer to processes rather than products of processes; they usually represent higher abstractions than the items of the preceding category.

a. recognizes symbol
b. cites rule
c. gives chronological sequence
d. gives steps of process, describes method
e. cites trend
f. names classification system or standard
g. names what fits given system or standard

1.3 Knowledge of Universals & Abstractions--deals with the highest of abstractions at the memory level. In order to evidence this behavior the individual must know major generalizations, their interrelations, and patterns into which information can be organized and structured. These items reflect the major concepts which comprise the framework of a discipline or major area of knowledge. The four items in this category are descriptions of behavior which would identify or verbalize a major concept.

a. states generalized concept or idea
b. states a principle, law, or theory
c. tells about organization or structure
d. recalls name of principle, law, or theory

2. Translation--is dependent upon possession of relevant knowledge. The task is to convert communication into known terms; it requires the understanding of the literal message in the communication. Communication is used here in its broadest sense; it could be a demonstration, a field trip, a musical work, a verbal message, or be demonstrated in pictorial or symbolic form.

a. restates in own words or briefer terms
b. gives concrete example of an abstract idea
c. verbalizes from a graphic representation
d. translates verbalization into graphic form
e. translates figurative statement to literal statement or vice versa
f. translates foreign language into English or vice versa

3. Interpretation--individual not only identifies and comprehends ideas, as in translation, but also understands their relationships. It goes beyond repetition and rephrasing the parts of a communication to determine the larger and more general ideas contained in it. Thus, comprehension may require reordering into a new configuration in the mind of a person, involving the determination of the relative importance of ideas and the interrelationships. However, the thinking is dependent upon what is given to the student--s/he is not expected to bring abstractions from other experiences into the situation.

a. gives reason (tells why)
b. shows similarities or differences
c. summarizes or concludes from observation of evidence
d. shows cause and effect relationship
e. gives analogy, simile, metaphor
f. performs a directed task or process

4. Application--individual must know an abstraction well enough to be able to demonstrate its use in a new situation. The task is to bring to bear upon given material or situation the appropriate information, generalizations or principles that are required to solve a problem. Application, as distinguished from comprehension, involves transfer of training. It is based on an individual's being able to apply previous learning to a new or novel situation without having to be shown how to use it. The problem itself is given.

a. applies previous learning to a new situation
b. applies principle to new situation
c. applies abstract knowledge in a practical situation
d. identifies, selects, and carries out process

5. Analysis--describes cognitive behavior in which there is an emphasis on the breakdown of material into its parts in order to detect the relationships of the parts and the way they are organized. The first four items at this level describe skills used in the identification or classification of the elements of the communication.

a. distinguishes fact from opinion
b. distinguishes fact from hypothesis
c. distinguishes conclusions from statements which support it
d. points out unstated assumption
e. shows interaction or relation of elements
f. points out particulars to justify conclusion
g. checks hypothesis with given information

    h. distinguishes relevant from irrelevant information
    i. detects error in thinking
    j. infers purpose, point of view, thoughts, feelings
    k. recognizes bias or propaganda

6. Synthesis (creativity)--represents cognitive activities in which the individual puts together elements and parts in order to form a whole in such a way as to constitute a pattern or structure that was not stated before. This entails recombining parts of earlier experiences in a new organization that is unique to the synthesizer. In analysis, the person takes apart a given whole; in synthesis s/he creates a whole.

    a. reorganizes ideas, materials, processes
    b. produces unique communication or divergent idea
    c. produces a plan, proposed set of operations
    d. designs an apparatus
    e. designs a structure
    f. devises scheme for classifying information
    g. formulates hypothesis, intelligent guess
    h. makes deductions from abstract symbols, propositions
    i. draws inductive generalization from specifics

7. Evaluation--describes activities of conscious judgment making; involves use of criteria or standards to determine the worth or value of methods, materials, or ideas. Evaluations must be distinguished from opinions which are usually made from an emotional or affective base.

    a. evaluates something from evidence
    b. evaluates something from criteria

Noncognitive Categories of Questions/Statements or Tasks (Davis & Tinsley, 1967)

Affectivity--questions/statements or tasks which elicit feeling, emotion, or opinion without a standard of appraisal, e.g., "How does the story make you feel?" or "Wasn't that a good story!"

Procedure--questions/statements or tasks related to organization, behavior, or management, e.g., "Are you listening to me?" or "Please get ready for class to begin."

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Programs for Exceptional Children

Exceptional children are (1) learners who because of permanent or temporary mental, physical, or emotional handicaps need special education and are unable to have all their educational needs met in a regular class without special education or related services, or (2) learners who demonstrate or have the potential to demonstrate outstanding intellectual aptitude and specific academic ability and, in order to develop these abilities, may require differentiated educational services beyond those ordinarily provided by the regular school program. Classifications of exceptional children include those who are autistic, academically gifted, hearing impaired (deaf or hard of hearing), mentally handicapped (educable, trainable, or severely/profoundly), multi-handicapped, orthopedically impaired, other health impaired, pregnant, behaviorally/emotionally handicapped, specific learning disabled, speech/language impaired, and visually impaired (blind or partially-sighted).

The primary purpose of exceptional children programs is to insure that handicapped and gifted learners develop mentally, physically, and emotionally to the maximum extent possible through the provision of an appropriate, individualized education in the proper setting.

Curricula for most exceptional learners follow the curricula designed for learners in general education. However, modification of instructional programs, creative instructional approaches, individualized programming, and appropriate selection and use of curricula are necessary to meet the special needs of exceptional learners. In curricula, emphasis must be given to instruction in arts education, communication skills, healthful living, mathematics, library/media skills, science, social studies, and vocational education. Attention must be focused upon cognitive, affective, psychomotor, and vocational development within the curricular areas. The Individualized Education Program for the handicapped and the Group Education Program for the academically gifted, both of which are based upon a comprehensive assessment, are to state in writing the special curricular offerings to be provided to each exceptional learner.

The Individual Education Program for the handicapped requires objective criteria, evaluation procedures, and schedules for determining, on at least an annual basis, whether or not short-term instructional objectives have been achieved. The Group Education Program for the academically gifted requires annual goals and evaluation methods. All special education instruction provided to handicapped and academically gifted learners is to be individualized and designed to meet unique learning needs.

Learning outcomes--knowledge, skills, concepts, understandings, and attitudes--for the handicapped and the academically gifted will differ from learner to learner. For many exceptional learners, the same learning outcomes developed for learners in general education will be appropriate. Some exceptional learners will meet the learning outcomes at a different time and in a different manner than learners in general education. Some handicapped learners might not meet the learning outcomes in general education and will need a totally different curriculum.

The majority of handicapped and academically gifted learners spend a portion of their instructional day within general education, integrated into classes with non-handicapped and nonacademically gifted learners. General education teachers, as well as exceptional education teachers, must be familiar with curricula and capable of selecting appropriate curricular goals and objectives based upon the unique educational needs of each learner as determined by comprehensive assessment, and as stated in the Individualized Education Program for exceptional learners, emphasis needs to be placed on instructional techniques rather than differentiated or modified curricula.

While the general education curricula are appropriate for most exceptional learners, there are times when the teacher must vary the curricular content: some children are not ready for certain types of curricular content at the usual age; some disabilities prevent or make difficult participation in certain learning experiences; different levels of ability may limit or encourage participation in certain school subjects; and some learners spend less time in school. Curricular choice is determined by need.

Curricular goals must be oriented toward skills and application instead of general knowledge. The goals must include skills related to maintaining health, communicating ideas, achieving personal and social growth, handling money concerns, working with measurements, getting along in an expanding community, coping with the physical environment, maintaining a home, using leisure time, and career development.

The competency-based curriculum is to be maximized for exceptional learners. Teachers must be familiar with the curriculum, making judicial use of it in the instructional program for handicapped and academically gifted learners.

Notes to Those Using the TEACHER HANDBOOK

The North Carolina Standard Course of Study, adopted by the State Board of Education, provides an overview of the basic curriculum which should be made available to every child in the public schools of our State. It includes the subject or skills areas of arts education, communication skills, guidance, healthful living, library/media skills, mathematics, science, second language studies, social studies, and vocational education as well as the philosophy and rationale underlying the curriculum and considerations which should be made in developing thinking skills and providing for the needs of exceptional children. The Teacher Handbook for the competency-based curriculum provides recommended goals and objectives and suggested measures for each subject or skills area.

Definitions

Competency Goals:	broad statements of general direction or purpose.
Objectives:	specific statements of what the student will know or be able to do.
Measures:	a variety of suggestions for ways in which the student may demonstrate s/he is able to meet the objective.

How to Read the Goals, Objectives, and Measures

Competency Goals have been written as complete sentences stating why the learner should be able to meet the stated objectives, e.g. "The learner will know causes and events of the settlement of the West."

For purposes of clarity and brevity Objectives have been written as phrases or clauses beginning with a verb, e.g., "Know the importance of railroads in the settlement of the West." These phrases or clauses would logically be preceded by "The learner will (know the importance of railroads in the settlement of the West)."

For purposes of clarity and brevity Measures have also been written as phrases or clauses beginning with a verb, e.g., "Describe the advantages of the railroad over horse-drawn wagon, river transportation, and other commonly used methods of transportation." These phrases or clauses would logically be preceded by "One way (or some ways) a student may demonstrate s/he is able to meet successfully the objective is to (describe the advantages of the railroad over horse-drawn wagon, river transportation, and other commonly used methods of transportation)."

Appendix E is an example of a page from the Teacher Handbook for the competency-based curriculum.

Student Placement

From kindergarten through eighth grade each skill or subject area has been divided into grade levels. This was done in order to make it easier for teachers to gain a general idea of what should be covered at each grade level. In order that instruction fit the individual needs of each student, it is most important that the classroom teacher use the activities in the Measures column to determine the appropriate placement for each child. For example, if a second-grade student is not able to complete successfully the Measures in the reading skills section at the second-grade level, Measures at the first-grade or kindergarten level should be administered. When the base level at which the child can perform successfully has been determined, instruction should begin with and proceed from that level of Competency Goals and Objectives.

The Measures column includes a variety of suggested means for assessing student performance including informal measurements (e.g., manipulatives, oral reports, role playing, projects, and some paper and pencil activities) and formal measurements (e.g., items for teacher-made tests, criterion referenced tests, and/or standardized tests). Some of the items in this column may be administered in whole-group or small-group situations; others should be given only to individual students. These items may be used for the purpose of pretesting to determine appropriate student placement, for monitoring ongoing student progress, and/or for post-testing to determine student learning.

It is apparent that in order for students to be placed appropriately for instruction (particularly in first through eighth grade), each teacher must have at least one, and preferably two or more, grade levels of the competency-based curriculum on each side of the grade s/he is teaching. It must be remembered that the higher the grade level the greater the span of students' needs and, therefore, the greater the need for a teacher to have a wider grade span of the curriculum available. An adequate grade span of the curriculum is also important for teachers of exceptional children at all grade levels.

Responsibility for Implementation

The North Carolina Standard Course of Study specifies which skills and subjects are to be taught at each grade level from kindergarten through grade twelve. The skills to be taught or developed at all grade levels are communication skills, library/media skills, thinking skills, and affective skills. The subjects to be taught from kindergarten through grade six are arts education, healthful living, mathematics, science, second language studies, and social studies. The same subjects, with the addition of vocational education, are to be taught in grades seven through twelve.

The Teacher Handbook for the competency-based curriculum provides recommendations for what should be taught in each skills or subject area from kindergarten through eighth grade and in each course from ninth through twelfth grade. Each teacher's primary responsibility is to teach the subject(s) or courses which s/he is specifically assigned, as well as to help students develop thinking and affective skills. However, each teacher also has a responsibility for appropriately integrating other skills (communication, library/media) and subjects (arts, healthful living, mathematics, science, second language studies, social studies, and vocational education) into the skills or subject areas which are her/his specific assignment.

Teachers in departmentalized schools at the middle/junior high or secondary levels have a responsibility for integrating curriculum in several ways. These include: (1) the integration of curriculum within their subject area in order to help students to make a smooth transition from one level to the next, e.g., from English I to English II, from Algebra I to Algebra II, from French II to French III; (2) the appropriate integration and development of those skills which are every teacher's responsibility (thinking and affective skills); and (3) whenever appropriate, the integration of other skills and subjects into their specifically assigned subject or skills area.

The Teacher Handbook for the competency-based curriculum serves as a resource guide for the integration of all skills and subjects in departmentalized situations. Teachers may look over the curriculum within the specific skills or subject area for which they are responsible in order to determine the overall scope and sequence. They may look at the outlines for thinking and affective skills in order to determine which of those skills have been integrated into their particular segments of the curriculum or to determine how they may integrate additional thinking and affective skills. Looking over other skills and subject areas will help teachers determine what should be appropriately integrated into their own areas. For example, while it is a primary responsibility of the high school English teacher to teach writing and speaking skills, the high school social studies teacher must be familiar with those skills and has a responsibility for reinforcing those skills in the written and oral work done in the social studies classes. Prior to beginning written and oral reports the social studies teacher should review the writing and speaking skills portions of the communications skills curriculum, using these as guidelines for instruction and the development of student assignments. Similar examples could be given with mathematics and science teachers or English and vocational education teachers.

Teachers in self-contained classrooms at the elementary, middle/junior high, or high school levels have the primary responsibility for integrating the curriculum in a variety of ways. These include: (1) integrating the curriculum within each skills or subject area in order to help students make a smooth transition from one grade level to the next; (2) integrating thinking skills and affective skills throughout all areas of the curriculum; (3) the integration of skills and subjects whenever possible though units of study;

(4) integrating skills and subjects introduced by teachers or specialists outside the homeroom into what is being taught within the homeroom; and (5) coordinating the efforts of teachers outside the homeroom (teachers of arts education, physical education, exceptional children, and library/media specialists, or guidance counselors) in order to supplement the homeroom curriculum. The Teacher Handbook for the competency-based curriculum serves as a guide for the integration of skills and subjects in self-contained situations as it does in departmentalized situations.

The principal shares in the responsibility for the successful implementation of the competency-based curriculum. The implementation and integration of the curriculum should be the focal point for decisions made by the principal in the role of instructional and administrative leader. Decisions made with respect to scheduling, disposition of student discipline, uninterrupted time for classroom instruction, and the distribution of materials and supplies may each serve to facilitate or frustrate the successful implementation and integration of the curriculum.

Staff within the area of Instructional Services at the North Carolina Department of Public Instruction also share responsibility for the successful implementation of the competency-based curriculum. Staff from the Regional Education Centers and Raleigh are, of course, available to assist Local Education Agencies in the implementation of the curriculum.

Use of Textbooks

The North Carolina Standard Course of Study is the curriculum approved for the public schools of North Carolina. Textbooks supplement this curriculum. With reference to their appropriateness for use with the North Carolina Standard Course of Study, textbooks are reviewed and recommended by the Textbook Commission. The State Board of Education then adopts a list of textbooks from which school districts make individual selections. Appendix G is a description of this process. If textbooks are at variance with the curriculum, the North Carolina Standard Course of Study takes precedence.

Computer Access

The North Carolina Standard Course of Study and the Teacher Handbook for the competency-based curriculum (with the exception of mathematics grades 7-12) have been entered on the IBM 5520 computer at the State Department of Public Instruction. Each skills or subject area at each grade level has been entered as a separate document. This allows Local Education Agencies, Institutions of Higher Education, and others with access to the mainframe in Raleigh to call up and print out any portion of the curriculum, e.g., any skills or subject area across all grade levels, all skills and subjects for one particular grade level, one subject at one grade level, or the entire competency-based curriculum. Those with access to the mainframe will, therefore, have immediate access to any revisions or additions to the curriculum.

Activities and Resources

The development or cataloging of activities and resources to assist in the implementation of the competency-based curriculum is an ongoing activity of Instructional Services staff working with teachers and others in each of the Local Education Agencies. Concentrating this effort in the local school districts provides teachers the opportunity to become familiar with the curriculum. As activities and resources are developed for each skills or subject area, they will be made available for State-wide dissemination through the IBM mainframe.

Working Space

Working space has been left at the end of goals throughout the Teacher Handbook for the competency-based curriculum. This space has been provided so that teachers may write in additional objectives and measures and/or make notes regarding instruction, activities, and resources.

How to Make Suggestions for Additions or Revisions

As with any viable curriculum, the Teacher Handbook for the competency-based curriculum must be open to constant review, expansion, and revision in order that it continue to meet the needs of the children of this State. Anyone having suggestions for additions to or revisions of this curriculum may complete and submit the form in Appendix I, or may contact:

Joseph B. Webb
Assistant State Superintendent
for Instructional Services
Education Building
Raleigh, NC 27611

Agricultural Education

COMPETENCY-BASED CURRICULUM

NORTH CAROLINA DEPARTMENT OF PUBLIC INSTRUCTION

VOCATIONAL EDUCATION

PURPOSE AND OVERVIEW

The overall mission of vocational education in the public schools is to provide a program capable of meeting the individual needs, interests, abilities, and aspirations of each student which is realistic in light of actual or anticipated opportunities for gainful employment, advanced education, and practical life application.

Specific purposes of vocational education are to:

1. Prepare individuals for entry-level employment in recognized occupations, new occupations, and emerging occupations at various levels of competence.

2. Prepare individuals for participation in advanced or highly skilled post-secondary vocational and technical education.

3. Provide individuals with laboratory experiences and activities which assist them in the making of informed and meaningful occupational choices, and/or which serve as the foundation for skilled vocational-technical education.

4. Provide individuals with laboratory experiences and activities which assist them in: (a) making informed consumer decisions; and (b) the application of practical life skills.

Competency-based courses are offered in eight vocational program areas:

1. Prevocational Education
2. Agricultural Education
3. Business and Office Education
4. Marketing Education
5. Health Occupations Education
6. Home Economics Education
7. Industrial Arts Education
8. Trade and Industrial Education

Vocational education provides appropriate programs and/or supportive services for persons who have academic, socioeconomic, and/or other disadvantages or handicaps that prevent them from succeeding in regular programs. It serves both in-school and out-of-school youths as well as adults.* Guidance, placement, and follow-up are also integral components of this program.

Target Groups

The major target group to be served by vocational education programs are youths in grades 7-12. In planning a vocational education competency-based curriculum, the following groups are listed in priority order for determining which target populations are to be served:

1. Students desiring immediate employment upon termination of high school. This group may include those who drop out or who graduate from high school, and desire to enter directly into the labor force.
2. Students who will engage in nongainful employment. This group includes students who apply their vocationally-related skills in situations without receiving pay. Examples are homemakers and volunteers.
3. Students who will engage in post-secondary training and education at less than the baccalaureate degree level. This group includes those persons who will pursue one-year, two-year, or other training programs in business schools, apprenticeship programs, technical colleges, and technical institutes, but who will not pursue a four-year college program. It may also include students who go directly into the military from high school.
4. Students who will pursue four-year or longer-term college degrees in fields related to vocational program areas.
5. Students who pursue nonvocationally-related college programs and who wish to develop practical life skills related to vocational educational and/or to develop certain vocationally-related skills transferable to other career settings.

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*NOTE: For purposes of this publication, "youths" is defined as persons between the ages of five and eighteen. "Adults" refers to the those persons over the age of eighteen. This is in support of, and not in conflict with, adult education provided by the community college system.

Philosophy

The State Board of Education has responsibility for providing direction and leadership to vocational education. This leadership is provided through the Master Plan for Vocational Education and other federally required plans.

The Master Plan encompasses all activities and programs, provides the framework for all other plans, and incorporates the vocational education philosophy of the State Board of Education. Implied within the philosophy of the State Board of Education are the following:

1. Vocational courses should be open to students regardless of race, sex, national origin, or handicapping conditions. Appropriate programs should be made available to students who have left high school and wish to pursue a course of study.
2. Teaching transferable skills and knowledge is important in preparing students to become adaptable in a changing work environment.
3. General education and vocational education are interdependent. General education programs should provide an awareness of career opportunities in their fields and how each is applied in the world of work. Vocational instruction should provide opportunities for students to apply communication and computation skills and other general education learnings to special occupational areas.
4. Employment needs and student aspirations should determine which occupational programs to offer with employment needs taking priority.
5. High quality vocational education programs require extensive planning with policies and guidelines from the state and federal government providing direction.
6. Input from local advisory committees, employment data, student surveys, and student follow-up are all necessary in planning, implementing, and evaluating local vocational programs.
7. Each student should be furnished written documentation of specific competencies achieved through participation in a vocational education program.
8. Counselors and all vocational teachers should form linkages with business, industry, and the community to increase the relevance of school for the work place. As a result, students should have the opportunity to participate in cooperative work experiences, internships, shadowing, and apprenticeships.
9. All students in vocational education should have an opportunity to develop and extend their learnings through participation in active vocational student organizations. The program of work for each

organization should be based on instructional competencies and be an integral part of the vocational program.

10. Strong vocational guidance, counseling, job placement, and follow-up services should be available to assist students in planning for their careers and enrolling in appropriate courses.

Planning and Designing the Curriculum

Trends in our society, as well as specific factors in the economy, technology, educational system, and the labor market influence planning an appropriate vocational education program. Vocational education planners need to design programs which will accommodate:

1. The availability of resources.
2. Changes in population characteristics.
3. Labor needs in new and emerging occupations, including small business ownership.
4. Labor needs in existing occupations with greater than average anticipated growth.
5. The rapid rates of increase in employment projected for the service sector of the public and private economy.
6. A projected decrease in occupations requiring a four-year college preparation.
7. The rapid changes in consumer technology.
8. Changes in individual and family lifestyles.

When designing the curriculum for a given school or the total school system, local planning personnel will need to organize a comprehensive and appropriate sequence of vocational offerings for students enrolled in grades 7-12 based on an assessment of the (1) student needs, interests, and aspirations, and (2) labor market demands and projections.

The following figure illustrates the minimal/ideal number of vocational program areas from which offerings may be selected to accommodate the elective program for a balanced, comprehensive secondary school system.

COURSE OF STUDY

MINIMUM PROGRAM	DESIRABLE PROGRAM	HIGHLY DESIRABLE PROGRAM*
Prevocational Program	Prevocational Program	Prevocational Program
PLUS	PLUS	PLUS
Introductory/Skill Development in a Single Sequence in no less than Three Program Areas	Introductory/Skill Development in Multiple Sequences in no less than Five Program Areas	Skill Development in Multiple Sequences in Seven Program Areas
		PLUS
		Specialized Non-sequenced Courses

*In a highly desirable program, students would also be provided the opportunity to participate in independent study or independent study combined with challenge exams for credit in programs which cannot be offered as formal courses in the school system.

Priority is to be given to the vocational skill development component of the program. However, planning must ensure that through the selection and combination of specific course offerings from the eight program areas, all students in grades 7-12 are given a chance to explore the world of work, begin to appraise their own individual talents, interests, aptitudes, and obtain vocational knowledge, skills, and attitudes in preparation for advanced training activities and/or practical life situations.

Within any program area of vocational education, the scope and sequence of course offerings may vary from district to district. In some program areas, it may take three or four courses to have a basic program while other program areas may require only one or two. What is basic in vocational education in any of the eight program areas is dependent upon the unique needs of an individual school district. To determine what is basic to a particular program area contact the district vocational education coordinator and review the Vocational Education: Program of Studies, Revised.

AGRICULTURAL EDUCATION

Program Description

Agricultural Education is a coordinated program of group and individual instructional activities consisting of classroom instruction, laboratory exercises, Future Farmers of America (FFA) activities, and supervised occupational experiences designed to develop competencies in high school students preparing to engage in agribusiness and agricultural occupations. Formal instruction may also be provided for out-of-school youth and adults who wish to upgrade their agricultural knowledge and skills.

For high school students, Future Farmers of America (FFA) activities are an integral part of the agricultural education program. Opportunities for development of leadership skills, cooperation, citizenship, and extension of classroom/laboratory learning experiences are provided through membership and participation in the organization.

Learning Outcomes

The broad objectives for students enrolled in Agricultural Education are to:

1. Develop an understanding of and appreciation for career opportunities in the broad field of agriculture and the preparation needed to enter and progress in agricultural occupations.
2. Develop agricultural competencies needed by individuals preparing to engage in agricultural occupations.
3. Develop those abilities in human relations which are essential in agricultural occupations.
4. Develop the ability to secure satisfactory placement and to advance in agricultural occupations through a program of continuing education.
5. Develop the abilities needed to exercise and follow effective leadership in fulfilling occupational, social, and civic responsibilities.
6. Develop practical life skills which will assist in planning, establishing, and maintaining a home and garden.

Scope and Sequence of Agricultural Education

The total scope and sequence of Agricultural Education includes varied program offerings for students in grades 9 through 12. Students may enter and progress through one of several program sequences in order to achieve their career objective within the agricultural education program. The determination of sequence(s) of offerings to make available to students in a local education agency should be based upon a documented assessment of the needs and interests of students, the labor needs and resources in the community, program enrollment, and availability of qualified teaching staff.

In Agricultural Education, the scope of basic program offerings includes:

1. Introduction to Agriculture/Natural Resources
2. Agricultural Production
3. Ornamental Horticulture
4. Agricultural Machinery/Equipment/Structures

Primarily based upon job market demand and student interests, each local education agency must decide on the variety and range of program offerings in each school. The chart below provides an example of the scope and sequence of program offerings for a given situation in which a comprehensive program is possible.

Agricultural Education, as illustrated in the chart below, includes instruction in three of six clusters of agricultural occupations. Three additional clusters may be offered by an LEA. These are Natural Resources and Environmental Protection, Aquaculture, and Forestry.

SAMPLE SCOPE AND SEQUENCE FOR AGRICULTURAL EDUCATION

Grade 9	Grade 10	Grade 11	Grade 12
	Ag Production I (Y)	Ag Production II (Y)	*Ag Production III (Y)
Introduction to Ag/Nat. Res.(Y)	Ornamental Horticulture I (Y)	Ornamental Horticulture II (Y)	*Ornamental Horticulture III (Y)
	Ag Machinery/ Equipment/ Structures I (Y)	Ag Machinery/ Equipment/ Structures II (Y)	*Ag Machinery/ Equipment/ Structures III (Y)
		Homestead and Gardening Skills (Y)	

NOTE: Y = 1 year

Courses are shown at first grade level to be offered and may be offered at any succeeding grade level.

*Cooperative work experiences, internships, and/or production work activities are strongly encouraged for each student enrolled at this level.

Introduction to Agriculture/Natural Resources is the basic course required for all students entering the program for the first time and is recommended for grade 9 or grade 10. When students enroll in Introduction to Agriculture/Natural Resources at grade 10, the Level I course of the selected cluster will begin at grade 11. This plan requires combining Level I and Level II courses into a two-hour block at grade 11 or combining Level II and Level III courses at grade 12 in order to complete the sequence. In individual schools where it is not feasible to offer Introduction to Agriculture/Natural Resources at grade 9 or grade 10, students may enter a modified Level I program at grade 10 or 11.

Agricultural Machinery/Equipment/Structures I Outline

1. FFA and SOEP
    - a. History and purposes of FFA
    - b. Importance and use of parliamentary procedure
    - c. Public speaking
    - d. Planning a SOEP
2. Occupational Opportunities in Agricultural Mechanics
3. Electric Arc Welding
    - a. Equipment, safety precautions, terminology, types of joints
    - b. Bead, groove, fillet welding, hole punching
4. Oxyacetylene Welding
    - a. Uses, equipment, safety precautions, terminology
    - b. Lighting torch, adjusting flame, shut-down
    - c. Heating metal for bending and shaping
    - d. Cutting metal and punching holes
    - e. Running a bead, fusion welds, brazing, and butt welds
5. Cutting Threads with Taps and Dies
6. Metal Working
    - a. Drilling holes
    - b. Using files
    - c. Using tin snips
    - d. Soldering
    - e. Cold chisels
    - f. Hand and power hacksaws
    - g. Shaping and forming metals
    - h. Metal working lathe
7. Internal Combustion Engines
    - a. Small engine fundamentals
    - b. Maintenance
    - c. Tune-up
    - d. Repair
    - e. Disassembly and assembly

8. Structures and Buildings

    a. Reading and using blueprints
    b. Construction tools
    c. Major parts of a building
    d. Types of farm buildings
    e. Structural, environmental, and economic factors of farm buildings
    f. Fastening devices
    g. Making joints and cuts in wood construction
    h. Glass work
    i. Farm fencing
    j. Concrete construction

Agricultural Machinery/Equipment/Structures II Outline

1. Rural Electrification

    a. Electrical terms, supplies, and equipment
    b. Calculating cost of electricity
    c. Planning and wiring a small farm building

2. Automation and Mechanization

3. Water and Waste Disposal

4. Welding

    a. Electric arc--vertical and horizontal welding
    b. Electric arc--carbon arc torch
    c. Electric arc--pipe welding
    d. Oxyacetylene--filled and lap welds
    e. Oxyacetylene--bronze welding

5. Tractor Maintenance

    a. Terms related to maintenance
    b. Gasoline and diesel engines
    c. Fuels and lubricants
    d. Transmission of power
    e. Types of bearings
    f. Preventive maintenance
    g. Safety precautions
    h. Wheel bearings
    i. Oil and oil filters
    j. Tuning
    k. Adjusting the clutch, brake, and valve tappets
    l. Servicing air cleaners, fuel systems, and batteries

Agricultural Machinery/Equipment/Structures III Outline

1. Employment Regulations, Policies, Standards

2. Electric Arc Welding

    a. Overhead welding
    b. Hardsurfacing
    c. MIG and TIG welding
    d. Cast iron welding

3. Oxyacetylene Welding

    a. Brazing cast iron
    b. Hardsurfacing
    c. Vertical and overhead welding

4. Tractor Maintenance and Repair

    a. Hydraulic systems
    b. Engines disassembly, repair, and reassembly
    c. Power take off
    d. Brakes and clutches

5. Automation and Mechanization

    a. Planning for automation
    b. Installing electric controls

6. Electric Motors and Drives

    a. Electric motor terms
    b. Types of electric motors
    c. Accessories and protective devices
    d. Electric motor nameplates
    e. Motor to machine drives
    f. Selection for a given job
    g. Parts of electric motors
    h. Advantages of electric motors
    i. Care and maintenance
    j. Belts and pulleys

7. Agricultural Equipment

    a. Safety and principles of operation
    b. Operator's manuals
    c. Sprayer calibration
    d. Parts department records

8. Water and Waste Disposal

   a. Terracing and strip cropping
   b. Irrigation systems

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 1: The learner will preside over FFA business and committee meetings.

Objectives		Measures
1.1	Possess a current knowledge of FFA activities so that organizational structure can be carried out effectively.	Refer to the VEG-AG-C/TIB 7033, pp. 13-14.
1.2	Be familiar with the different committees in FFA.	
1.3	Have a working knowledge of duties and responsibilities of different FFA officers.	
1.4	Demonstrate the ability to preside over FFA chapter and committee meetings.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 2: The learner will perform correctly fourteen parliamentary procedure skills.

	Objectives	Measures
2.1	Define "parliamentary procedure."	Refer to the VEG-AG-C/TIB 7033, pp. 15-16.
2.2	List five reasons for the use of parliamentary procedure.	
2.3	Demonstrate the correct use of at least six rules of parliamentary procedure.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 3: The learner will prepare and present a five minute speech.

	Objectives	Measures
3.1	Prepare a speech related to agriculture or FFA.	Refer to the VEG-AG-C/TIB 7033, pp. 17-18.
3.2	Deliver a prepared speech in the classroom or in a public situation.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 4: The learner will make an inventory of assets and liabilities.

	Objectives	Measures
4.1	Define "assets" and "liabilities."	Refer to the VEG-AG-C/TIB 7033, pp. 19-20.
4.2	Determine the net worth of an individual.	
4.3	Define inventory.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 5: The learner will keep an up-to-date record book including expenses, receipts, work performed, and financial statements.

	Objectives	Measures
5.1	Prepare a financial statement.	Refer to the VEG-AG-C/TIB 7033, pp. 21-22.
5.2	Make entries of receipts and expenses in a farm record book.	
5.3	Analyze farm production records.	
5.4	Make agriculture production entries in a farm record book.	

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COMPETENCY GOAL 6: The learner will identify occupations requiring competencies in agricultural mechanics.

	Objectives	Measures
6.1	Name ten occupations which require competencies in agricultural mechanics.	Refer to the VEG-AG-C/TIB 7033, pp. 23-24.
6.2	Identify three agribusinesses in the community which have jobs requiring competencies in agriculture.	

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Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 7: The learner will identify competencies needed for jobs in agricultural mechanics.

	Objectives	Measures
7.1	List specific competencies needed for five agricultural mechanics jobs.	Refer to the VEG-AG-C/TIB 7033.
7.2	Identify competencies needed for employment in production agriculture.	

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COMPETENCY GOAL 8: The learner will identify educational requirements for occupations in agricultural mechanics.

	Objectives	Measures
8.1	List education requirements for five agricultural mechanics occupations.	Refer to the VEG-AG-C/TIB 7033, pp. 26-27.

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COMPETENCY GOAL 9: The learner will identify personal qualifications for employment in agricultural mechanics.

	Objectives	Measures
9.1	List the personal qualifications needed for employment in five agricultural mechanics occupations.	Refer to the VEG-AG-C/TIB 7033, pp. 28-29.
9.2	List two good qualifications for machine personnel.	
9.3	Determine qualifications for self-employment in agricultural mechanics occupation.	

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COMPETENCY GOAL 10: The learner will identify and describe the uses of the following electric welding equipment and materials: A.C. Welder, D.C. Welder ground cable and clamps, electrode holder, electrode chipping hammer, peening hammer.

	Objectives	Measures
10.1	Define terms used in electric welding.	Refer to the VEG-AG-C/TIB 7033, pp. 30-31.
10.2	Explain the use of parts of the welder.	
10.3	List four examples to illustrate the use of an electric welder.	

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Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 11: The learner will describe safety precautions to follow in welding.

Objectives	Measures
11.1 Illustrate five safe practices to follow in preparing to weld.	Refer to the VEG-AG-C/TIB 7033, pp. 32-33.
11.2 Explain safety procedures to follow when welding on wet surface.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 12: The learner will describe the characteristics of the following metals commonly used in arc-welding: wrought iron, low carbon steel, high carbon steel, cast iron, malleable iron, nickel.

	Objectives	Measures
12.1	Identify five metals by the spark test.	Refer to the VEG-AG-C/TIB 7033, pp. 34-35.
12.2	Select the correct metal for three different repair jobs.	

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COMPETENCY GOAL 13: The learner will describe terms related to arc-welding: arc-welding, slag, flux, polarity, arc-length, bead, fillet weld, butt weld, fusion welding, padding, distortion, pre-heating, undercut, groove-weld, single pass weld, multiple pass weld, overlap, A.W.S., A.S.T.M.

	Objectives	Measures
13.1	Define terms related to electric arc-welding.	Refer to the VEG-AG-C/TIB 7033, pp. 38-39.
13.2	Explain the function of parts of the welder.	

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COMPETENCY GOAL 14: The learner will identify joints used in arc welding: butt, lap, corner, edge, and tee.

	Objectives	Measures
14.1	Select the correct joint for the job being done.	Refer to the VEG-AG-C/TIB 7033, pp. 38-39.
14.2	List one use of each type of weld joint.	

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COMPETENCY GOAL 15: The learner will use an electric welder safely and properly in order to: run a bead in a flat position, make a fillet weld, make a groove weld in a flat position, punch a hole in a piece of metal, and do multiple pass welding.

	Objectives	Measures
15.1	Demonstrate safe practices to follow in setting up the welder and in welding.	Refer to the VEG-AG-C/TIB 7033, pp. 40-41.
15.2	Run a bead in a flat position.	
15.3	Make a fillet weld.	
15.4	Make a groove weld in a flat position.	
15.5	Punch a hole in a piece of metal.	
15.6	Perform multiple pass welding.	

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Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 16: The learner will describe the following terms related to oxyacetylene welding: neutral flame, oxidizing flame, carburizing flame, backfire, flashback, flux, butt weld, fillet weld, bead, fusion welding, and bronze welding.

	Objectives	Measures
16.1	Define terms used in oxyacetylene welding.	Refer to the VEG-AG-C/TIB 7033, pp. 42-43.
16.2	Explain the use of parts of the welder.	

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Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 17: The learner will describe the two gases used in oxyacelytene welding, (i.e., oxygen and acetylene).

	Objectives	Measures
17.1	Distinguish between the gases used in welding by the odor.	Refer to the VEG-AG-C/TIB 7033, pp. 44-45.
17.2	Identify the function of each gas used in welding.	

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Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 18: The learner will describe the advantages and disadvantages of oxyacetylene welding.

	Objectives	Measures
18.1	List advantages of oxyacetylene welding for a specific project.	Refer to the VEG-AG-C/TIB 7033, pp. 46-47.
18.2	Describe the limitations of oxyacetylene welding.	

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Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 19: The learner will identify uses of oxyacetylene welding in agricultural mechanics.

	Objectives	Measures
19.1	List four uses of oxyacetylene welding.	Refer to the VEG-AG-C/TIB 7033, pp. 48-49.
19.2	Illustrate the use of a welder to heat metal and build up worn parts.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 20: The learner will describe safety precautions to follow in using oxyacetylene equipment.

	Objectives	Measures
20.1	Illustrate five safe practices to follow in preparing to weld.	Refer to the VEG-AG-C/TIB 7033, pp. 50-51.
20.2	Demonstrate safety practices to follow while using the welder.	

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Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 21: The learner will recognize the parts of welding equipment.

Objectives		Measures
21.1	Secure a welder safely.	Refer to the VEG-AG-C/TIB 7033, pp. 52-53.
21.2	Point out parts of the welder.	
21.3	Explain the function of parts of the welder.	

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COMPETENCY GOAL 22: The learner will set up the welder, light and adjust flame, select the proper tip size, clean tips, turn off flame, and secure the welder.

	Objectives	Measures
22.1	Attach regulators and hoses to the welder.	Refer to the VEG-AG-C/TIB 7033, pp. 54-55.
22.2	Select the correct welding tip for specific welding jobs.	
22.3	Clean the welding tip.	
22.4	Light the torch and adjust its flame to an oxidizing, carburizing, and neutral flame.	
22.5	Secure a welder properly and safely.	

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COMPETENCY GOAL 23: The learner will use oxyacetylene equipment as a source of heat for bending or shaping metal.

	Objectives	Measures
23.1	Heat a piece of metal with the oxyacetylene welder and bend it into a specified shape.	Refer to the VEG-AG-C/TIB 7033, pp. 56-57.
23.2	Select the correct tip for heating a specified piece of metal.	
23.3	Make flame adjustments for heating metal.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 24: The learner will cut a piece of metal with the cutting torch.

Objectives		Measures
24.1	Preheat the metal for cutting.	Refer to the VEG-AG-C/TIB 7033, p. 58.
24.2	Cut a piece of metal to a specified dimension.	

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Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 25: The learner will punch a hole in metal.

Objectives		Measures
25.1	Punch a given size hole in metal.	Refer to the VEG-AG-C/TIB 7033, p. 59.
25.2	Cut holes of various shapes in metal.	

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COMPETENCY GOAL 26: The learner will run bead without rod.

	Objectives	Measures
26.1	Control a molten puddle on a piece of 14-gauge metal.	Refer to the VEG-AG-C/TIB 7033, p. 60.
26.2	Run a bead 2" long on a piece of 14-gauge metal.	

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COMPETENCY GOAL 27: The learner will fuse metals together.

	Objectives	Measures
27.1	Fuse two pieces of 2" x 4" 14-gauge metal together.	Refer to the VEG-AG-C/TIB 7033, p. 61.

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COMPETENCY GOAL 28: The learner will braze thin metal.

Objectives		Measures
28.1	Braze two pieces of 2" x 4" 14-guage metal using 1/2" lap joint.	Refer to the VEG-AG-C/TIB 7033, p. 62.
28.2	Tin the edge of a 2" x 4" piece of 14-gauge metal.	

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COMPETENCY GOAL 29: The learner will run flat bead with rod.

	Objectives	Measures
29.1	Run a 4" bead, 1/2" wide, on a piece of 2" x 4" 14-gauge metal.	Refer to the VEG-AG-C/TIB 7033, p. 63.

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COMPETENCY GOAL 30: The learner will make a butt weld.

	Objectives	Measures
30.1	Make a butt weld using two pieces of 1/8" x 2" x 4" mild steel.	Refer to the VEG-AG-C/TIB 7033, p. 64.
30.2	Make a single pass weld.	
30.3	Make a multiple pass weld.	

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Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 31: The learner will cut threads with tap and die.

	Objectives	Measures
31.1	Recognize the hazards involved in cutting threads with tap and die.	Refer to the VEG-AG-C/TIB 7033, pp. 65-66.
31.2	Identify the different types of threads.	
31.3	Demonstrate correct methods in applying threads to bolts and pipe.	
31.4	Recognize and identify the tools necessary for applying threads to bolts and pipe.	
31.5	Demonstrate correct methods in tapping a hole.	

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Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 32: The learner will drill holes.

Objectives		Measures
32.1	Recognize the hazards involved in drilling holes.	Refer to the VEG-AG-C/TIB 7033, pp. 67-68.
32.2	Select the correct type of drilling machine and drill for the job to be completed.	
32.3	Layout and measure material to be drilled.	
32.4	Drill a hole in a piece of metal to specifications.	

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Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 33: The learner will use files.

	Objectives	Measures
33.1	Recognize the hazards involved in using files.	Refer to the VEG-AG-C/TIB 7033, pp. 69-70.
33.2	Identify the different types of files.	
33.3	Demonstrate correct methods in using various types of files.	
33.4	Select a proper file for a given job.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 34: The learner will cut with tin snips, shape metal, and form joints.

	Objectives	Measures
34.1	Recognize the hazards involved in cutting metal with tin snips.	Refer to the VEG-AG-C/TIB 7033, pp. 71-72.
34.2	Identify and describe the uses of different types of tin snips.	
34.3	Demonstrate the correct method of cutting metal with tin snips.	

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Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 35: The learner will solder metal.

	Objectives	Measures
35.1	Recognize the different types of soldering equipment and supplies.	Refer to the VEG-AG-C/TIB 7033, pp. 73-74.
35.2	Select the proper equipment and supplies to complete a given task.	
35.3	Determine the soldering operation required for a given task which will produce maximum durability.	
35.4	Recognize the hazards involved in the use of soldering equipment and supplies.	
35.5	Solder a given project.	

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Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 36: The learner will cut with cold chisels.

	Objectives	Measures
36.1	Recognize the hazards involved in cutting metal with cold chisels.	Refer to the VEG-AG-C/TIB 7033, pp. 75-76.
36.2	Identify and describe the different types of cold chisels.	
36.3	Demonstrate the correct method of cutting metal with cold chisels.	

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Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 37: The learner will cut with a hand hacksaw and a power hacksaw.

	Objectives	Measures
37.1	Recognize the hazards involved in cutting metal with either a hand or power hacksaw.	Refer to the VEG-AG-C/TIB 7033, pp. 77-78
37.2	Select the blade needed for the job.	
37.3	Demonstrate correct procedures in cutting metal with a hand hacksaw.	
37.4	Demonstrate correct procedures in cutting metal with a power hacksaw.	

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Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 38: The learner will shape, anneal, harden, and temper metal.

Objectives	Measures
38.1 Anneal metal.	Refer to the VEG-AG-C/TIB 7033, pp. 79-80.
38.2 Harden metal.	
38.3 Temper metal.	
38.4 Make a piece of metal shorter and/or longer.	

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Skills/Subject Area: Agricultural Machinery/ Equipment/Structures

COMPETENCY GOAL 39: The learner will operate the metal working lathe.

	Objectives	Measures
39.1	Recognize the hazards involved in operating the metal lathe.	Refer to the VEG-AG-C/TIB 7033, pp. 81-82.
39.2	Make the necessary adjustments needed for operating the metal lathe.	
39.3	Demonstrate the correct methods in operating the lathe in order to produce various projects.	

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COMPETENCY GOAL 40: The learner will operate a gas forge.

	Objectives	Measures
40.1	Identify parts of a gas forge.	Refer to the VEG-AG-C/TIB 7033, pp. 83-84.
40.2	Heat metal using a gas forge.	

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COMPETENCY GOAL 41: The learner will operate a coal forge.

Objectives		Measures
41.1	Identify parts of a coal forge.	Refer to the VEG-AG-C/TIB 7033, pp. 85-86.
41.2	Identify and use forge tools.	
41.3	Heat metal in a forge.	

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Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 42: The learner will describe the following terms related to internal combustion engines: 2 stroke-cycle, 4 stroke-cycle, compression, compression ratio, internal combustion, cycle, stroke, and horsepower.

	Objectives	Measures
42.1	Describe the terms internal combustion, cycle, stroke, two-stroke cycle, four-stroke cycle, compression, compression ratios, horsepower, and torque.	Refer to the VEG-AG-C/TIB 7033, pp 87-88.
42.2	Describe the relationship between horsepower and torque.	
42.3	Calculate simple horsepower problems.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 43: The learner will describe the types of internal combustion engines.

	Objectives	Measures
43.1	Identify different types of internal combustion engines.	Refer to the VEG-AG-C/TIB 7033, pp. 89-90.

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COMPETENCY GOAL 44: The learner will describe the basic principles of internal combustion engines.

	Objectives	Measures
44.1	Discuss the unique characteristics of the gas and diesel engines.	Refer to the VEG-AG-C/TIB 7033, pp. 91-92.

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 45: The learner will describe the strokes in a two- and four-cycle engines and describe what happens in each.

	Objectives	Measures
45.1	List the strokes of a four-stroke-cycle engine.	Refer to the VEG-AG-C/TIB 7033, pp. 93.
45.2	Describe the relationship among the valves, pistons, and ignition system of a four-stroke spark ignition system.	
45.3	Describe the operation of both two- and four-cycle diesel engines.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 46: The learner will identify major parts of internal combustion engines and describe the function of each.

Objectives		Measures
46.1	List the basic parts of the internal combustion engine.	Refer to the VEG-AG-C/TIB 7033, pp 94-95.
46.2	Identify the support systems and component parts to include the electrical, fuel, cooling, lubrication, and exhaust system.	
46.3	Describe the function of each component part of the engine, its support systems, and their component parts.	

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Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 47: The learner will define the following terms related to small gasoline engines: 2 stroke-cycle, 4 stroke-cycle, cycle, stroke, rich mixture, trouble shooting, venturi, RPM, blow-by, horse power, preventive maintenance, operators' manual, and overhaul.

	Objectives	Measures
47.1	Define the following terms: small engine, two-stroke cycle, four-stroke cycle, fuel mixture, venturi, blow-by, RPM, CID, horsepower, troubleshooting, preventive maintenance, operator's manual, and overhaul.	Refer to the VEG-AG-C/TIB 7033, pp. 96-97.

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 48: The learner will describe the major support systems in an internal combustion engine: cooling, electrical, lubrication, fuel, intake, and exhaust.

	Objectives	Measures
48.1	Describe the function of the cooling, electrical, lubrication, fuel intake, starting, and exhaust systems.	Refer to the VEG-AG-C/TIB 7033, pp. 98-99.
48.2	Compare and contrast ignition systems.	
48.3	Compare and contrast starting systems.	
48.4	Compare and contrast carburetor designs.	
48.5	Compare and contrast types of air cleaners.	
48.6	Compare and contrast lubrication systems.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 49: The learner will perform daily, weekly, monthly, and yearly maintenance jobs.

	Objectives	Measures
49.1	Perform daily maintenance of small engines as prescribed in operator's manual.	Refer to the VEG-AG-C/TIB 7033, pp. 100-102.
49.2	Perform 25-hour maintenance as prescribed in the operator's manual for a small engine.	
49.3	Perform yearly maintenance on a small engine as prescribed in the operator's manual.	
49.4	List the steps to prepare a small engine for storage.	

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COMPETENCY GOAL 50: The learner will recognize tools for diagnosis and repair of small gasoline engines.

	Objectives	Measures
50.1	Identify hand tools used in repairing small engines.	Refer to the VEG-AG-C/TIB 7033, pp. 103-104.
50.2	Identify testing equipment used in troubleshooting problems in small engines.	

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COMPETENCY GOAL 51: The learner will prepare a preventative maintenance schedule for a small gasoline engine.

	Objectives	Measures
51.1	Outline a preventative maintenance schedule for an engine using the operator's manual.	Refer to the VEG-AG-C/TIB 7033, p. 105.

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Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 52: The learner will tune a small engine.

Objectives		Measures
52.1	List the procedure for tuning a small gasoline engine.	Refer to the VEG-AG-C/TIB 7033, pp. 106-107.
52.2	Indicate those parts of an engine that should be serviced or replaced using the appropriate tester or gauge.	
52.3	Tune a small engine as prescribed by the operators' manual.	

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Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 53: The learner will change oil and oil filters, and service all points needing lubrication.

Objectives	Measures
53.1 Identify the points on a small engine that require lubrication.	Refer to the VEG-AG-C/TIB 7033, pp. 108-109.
53.2 Drain oil and refill crankcase to the proper level using the correct oil as prescribed in the operator's manual.	
53.3 Change oil filters.	
53.4 Select correct lubricating material and lubricate all service points.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 54: The learner will disassemble and reassemble a small gasoline engine.

Objectives		Measures
54.1	Disassemble a small gasoline engine.	Refer to the VEG-AG-C/TIB 7033, pp. 110-111.
54.2	Assemble a small gasoline engine.	
54.3	Identify parts of an engine.	
54.4	Explain the relationship of one part to another in a small gasoline engine.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 55: The learner will grind, seat, and adjust valves.

	Objectives	Measures
55.1	Select and operate valve repair tools and materials including valve grinders, refacers, and grinding compound.	Refer to the VEG-AG-C/TIB 7033, p. 112.
55.2	Recondition a valve to include refacing, lapping, and adjusting lash.	

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Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 56: The learner will service all types of air cleaners.

Objectives		Measures
56.1	Service both oil bath and oiled filter air cleaners using proper cleaners and cleaning technique.	Refer to the VEG-AG-C/TIB 7033, pp. 113-114.
56.2	Determine when a dry filter needs replacement.	

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COMPETENCY GOAL 57: The learner will adjust the carburetor properly.

	Objectives	Measures
57.1	Identify the adjustments found on the three basic carburetor designs.	Refer to the VEG-AG-C/TIB 7033, pp. 115-116.
57.2	Adjust the idle speed, idle mixture, and load mixture on a gravity-free carburetor.	

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Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 58: The learner will clean a small engine and inspect its cooling system.

Objectives		Measures
58.1	Discuss the advantages of a clean engine.	Refer to the VEG-AG-C/TIB 7033, pp. 117-118.
58.2	Demonstrate proper maintenance of the cooling system.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 59: The learner will service the fuel system on a small engine.

	Objectives	Measures
59.1	Replace the fuel filters.	Refer to the VEG-AG-C/TIB 7033, pp. 119-120.
59.2	Disassemble a carburetor, clean its parts in solvent, and reassemble it using new gaskets.	
59.3	Clean the sediment bowl.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 60: The learner will repair starters on small engines.

	Objectives	Measures
60.1	Repair both recoil and windup starters.	Refer to the VEG-AG-C/TIB 7033, pp. 121-122.
60.2	Inspect and repair electric starters.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 61: The learner will service and repair governors on small engines.

	Objectives	Measures
61.1	Adjust the governor speed on a small engine according to manufacturer's specifications.	Refer to the VEG-AG-C/TIB 7033, pp. 122-123.
61.2	Replace the governor spring on a pneumatic governor.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 62: The learner will repair generator systems on small engines.

	Objectives	Measures
62.1	Test generator and alternator systems of small engines for proper operation.	Refer to the VEG-AG-C/TIB 7033, pp. 124-125.
62.2	Make the necessary repairs on charging systems to restore them to proper operating condition.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 63: The learner will read and interpret blueprints for a project such as a sawhorse, feeder, trailer, or small farm building.

Objectives		Measures
63.1	Recognize different types of drawings.	Refer to the VEG-AG-C/TIB 7033, pp. 126-127.
63.2	Recognize different symbols used in producing typical project plans.	
63.3	Determine dimensions using project plan scales.	
63.4	Relate project plans to an actual project.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 64: The learner will use construction tools safely and properly to construct a project such as a feeder, sawhorse, trailer, or small utility building.

	Objectives	Measures
64.1	Recognize the hazards involved in using construction tools.	Refer to the VEG-AG-C/TIB 7033, pp. 128-129.
64.2	Identify and describe the functions of various tools and equipment used in construction.	
64.3	Select the proper tools and equipment for the task.	
64.4	Demonstrate correct procedures in operating various construction tools.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 65: The learner will describe the function of the major parts of a building.

Objectives	Measures
65.1 Identify the major parts of a building.	Refer to the VEG-AG-C/TIB 7033, pp. 130-131.
65.2 Describe the functions of the major parts of a building.	
65.3 Explain each building part's function in relation to its location in the building.	
65.4 Recognize the different materials that can be used in fabricating different parts of a building.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 66: The learner will describe types of farm buildings and roof types for machinery protection, machinery repair, crop storage, livestock housing, and general use.

	Objectives	Measures
66.1	Recognize different types of farm buildings.	Refer to the VEG-AG-C/TIB 7033, pp. 132-133.
66.2	Identify advantages and disadvantages of various types of farm buildings.	
66.3	Determine the type of farm buildings needed for individual uses.	
66.4	Identify roof types used on farm buildings.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 67: The learner will describe structural, environmental, and economic factors and requirements for farm buildings.

Objectives		Measures
67.1	Recognize the structural requirements of farm buildings.	Refer to the VEG-AG-C/TIB 7033, pp. 134-135.
67.2	Recognize the environmental factors which must be considered when constructing farm buildings.	
67.3	Recognize the economic factors involved when selecting building materials and constructing different types of farm buildings.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 68: The learner will describe the advantages and disadvantages of paints and wood preservatives.

	Objectives	Measures
68.1	Recognize the hazards involved in applying paint and wood preservatives.	Refer to the VEG-AG-C/TIB 7033, pp. 136-137.
68.2	Realize the value of paint in preserving farm structures.	
68.3	Select paint and/or a wood preservative for a specified job.	
68.4	Apply paint and/or a wood preservative to a small building or other wood project.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 69: The learner will demonstrate the proper use of fastening devices used in farm construction.

	Objectives	Measures
69.1	Recognize different types of fastening devices.	Refer to the VEG-AG-C/TIB 7033, pp. 138-139.
69.2	Describe the functions of different types of fastening devices.	
69.3	Select the appropriate fastening device for a specified job.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 70: The learner will make the following joints and cuts in wood used in wood construction: butt, rabbet, miter, spliced, oblique butt, notched, glued, dade, chamfer, bevel, tongue, groove, half lap, cross lap, end lap, middle lap, thru mortise tenon, stub mortise tenon, open mortise tenon, and lap dovetail.

	Objectives	Measures
70.1	Recognize the hazards involved in making joints and cuts used in wood construction.	Refer to the VEG-AG-C/TIB 7033, pp. 140-142.
70.2	Identify the different types of joints and cuts used in wood construction.	
70.3	Select the joint or cut which best fits the task.	
70.4	Cut wood joints for a specific project.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 71: The learner will mark and cut glass and install a window pane.

	Objectives	Measures
71.1	Recognize the hazards involved in working with glass.	Refer to the VEG-AG-C/TIB 7033, pp. 143-144.
71.2	Recognize the different types of glass.	
71.3	Develop competencies in marking and cutting glass.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 72: The learner will describe the advantages and disadvantages of types of fences.

	Objectives	Measures
72.1	Select the best fence for a specified job.	Refer to the VEG-AG-C/TIB 7033, pp. 145-146.
72.2	Identify advantages and disadvantages of each type of fence.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 73: The learner will install an electric, barbed wire, woven wire, and board fence.

	Objectives	Measures
73.1	Install an electric, barbed wire, woven wire, and board fence.	Refer to the VEG-AG-C/TIB 7033, pp. 147-149.
73.2	Select proper hardware used to install fences.	
73.3	Use fencing tools properly.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 74: The learner will describe types of fence posts and preservatives used on posts.

Objectives		Measures
74.1	List the advantages and disadvantages of each type of fence post.	Refer to the VEG-AG-C/TIB 7033, pp. 150-151.
74.2	Select the most economical fence post for a specified job.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 75: The learner will pour and finish a concrete project such as a walk or mail box post, select quality materials, and compute the quantity of each material.

	Objectives	Measures
75.1	Recognize the hazards involved in working with concrete.	Refer to the VEG-AG-C/TIB 7033, pp. 152-153.
75.2	Describe the composition of concrete.	
75.3	Calculate quantities of concrete required to complete a given project.	
75.4	Place the concrete.	
75.5	Finish the concrete.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 76: The learner will define selected terms correctly: ampere, volts, voltage drop, watts, kilowatts, direct current, alternating current, circuit, phase, hot wire, neutral or ground wire, polarizing, Underwriter's Laboratories (UL), National Electric Code, transformer, conductor, insulator, cable, connectors, micrometer, voltmeter, wattmeter, fuse and circuit breaker, and Ohms' Law.

	Objectives	Measures
76.1	Explain difference in volts, watts, amperes, and ohms.	Refer to the VEG-AG-C/TIB 7033, pp. 154-155.
76.2	Determine if the current is direct or alternating.	
76.3	Explain what is meant by the Underwriter's Laboratory Seal and the National Electric Code.	
76.4	Read a voltmeter, ammeter, and wattmeter.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 77: The learner will describe the use of electrical supplies and equipment.

Objectives		Measures
77.1	Identify different types of electrical wire and electrical supplies.	Refer to the VEG-AG-C/TIB 7033, pp. 156-157.
77.2	Explain the uses of electrical supplies such as solderless connectors, single-pole switches, three-way switches.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 78: The learner will read a kilowatt hour meter and figure the amount and cost of power used.

	Objectives	Measures
78.1	Read a kilowatt hour meter.	Refer to the VEG-AG-C/TIB 7033, pp. 158-159.
78.2	Determine the amount of electricity used per month.	
78.3	Figure cost of a month's supply of electricity.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 79: The learner will identify electrical symbols used in wiring.

	Objectives	Measures
79.1	Identify electrical symbols.	Refer to the VEG-AG-C/TIB 7033, pp. 160-161
79.2	Select electrical material by its symbols.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 80: The learner will repair an electrical appliance or lamp.

Objectives		Measures
80.1	Install a filament in a toaster.	Refer to the VEG-AG-C/TIB 7033, pp. 162-163.
80.2	Attach a male plug to a light cord.	
80.3	Attach a light socket to a light cord.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 81: The learner will plan and install the wiring system for a small farm building which would include general purpose outlets, single pole, three-way, and four-way switches.

	Objectives	Measures
81.1	Draw a diagram of a small building wiring plan.	Refer to the VEG-AG-C/TIB 7033, pp. 164-165.
81.2	Install an electrical circuit.	
81.3	Determine the number of outlets needed.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 82: The learner will troubleshoot electrical circuit problems.

Objectives		Measures
82.1	Use a circuit breaker.	Refer to the VEG-AG-C/TIB 7033, pp. 166-167.
82.2	Read a voltmeter, ammeter, and ohmmeter.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 83: The learner will install control devices, thermostats, humidistat timers, and pressure switches.

	Objectives	Measures
83.1	Determine the need for an electric control device.	Refer to the VEG-AG-C/TIB 7033, pp. 168-169.
83.2	Select proper tools to install electrical controls.	
83.3	Follow safety procedures in installing electrical controls.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 84: The learner will identify and describe the use of pipe fittings, plumbing fixtures, and pipe used in farm water systems.

	Objectives	Measures
84.1	Select the pipe fittings for a specific job.	Refer to the VEG-AG-C/TIB 7033, pp. 170-171.
84.2	Select the plumbing fixtures for a specific job.	
84.3	Identify which kind of pipe is used in plumbing.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 85: The learner will use plumbing tools properly and safely to measure, cut, thread, and connect pipe.

	Objectives	Measures
85.1	Measure pipe accurately.	Refer to the VEG-AG-C/TIB 7033, pp. 172-173.
85.2	Cut pipe.	
85.3	Thread pipe.	
85.4	Join each kind of pipe together.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 86: The learner will plan the water and waste disposal needs for a small farm.

	Objectives	Measures
86.1	Make a drawing for a water system.	Refer to the VEG-AG-C/TIB 7033, pp. 174-175.
86.2	Determine the correct size of water system needed for a specific farm.	
86.3	Select fittings for a specified water system.	
86.4	Select fixtures for a specified water system.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 87: The learner will describe types of pumps used in farm water systems.

Objectives		Measures
87.1	Determine which size pump should be selected.	Refer to the VEG-AG-C/TIB 7033, pp. 176-177.
87.2	Figure the amount of water needed on a farm.	
87.3	Draw a diagram of a water system.	
87.4	Select correct pipe for a given supply of water.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 88: The learner will weld in vertical and horizontal positions.

	Objectives	Measures
88.1	Make a weld in the vertical position.	Refer to the VEG-AG-C/TIB 7033, pp. 178-180.
88.2	Make a weld in the horizontal position.	
88.3	Select the proper electrode for both horizontal and vertical welding.	
88.4	Adjust the current necessary for welding.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/ Equipment/Structures

COMPETENCY GOAL 89: The learner will use a carbon arc torch to heat and braze metal.

	Objectives	Measures
89.1	Heat with the carbon arc torch.	Refer to the VEG-AG-C/TIB 7033, pp. 181-182.
89.2	Braze with the carbon arc torch.	
89.3	Select brazing rods.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 90: The learner will weld pipe.

Objectives		Measures
90.1	Weld pipe together.	Refer to the VEG-AG-C/TIB 7033, pp. 183-184.
90.2	Select the appropriate electrode used for welding pipe.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 91: The learner will make fillet and lap welds.

Objectives	Measures
91.1 Make a fillet weld using two pieces of metal.	Refer to the VEG-AG-C/TIB 7033, pp. 185-186.
91.2 Make a lap weld using two pieces of metal.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 92: The learner will build up worn metal parts with bronze.

	Objectives	Measures
92.1	Build up a worn metal part by brazing with the oxyacetylene welder.	Refer to the VEG-AG-C/TIB 7033, pp. 187-188.
92.2	Adjust oxygen and acetylene pressures.	
92.3	Select bronze rods used for building up worn metal parts.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 93: The learner will describe terms related to tractors: 4-stroke cycle compression, compression ratio, internal combustion, cycle, stroke, rich mixture, lean mixture, troubleshooting, RPM, diesel engine, detonation, preignition, backfiring, gasket, venturi, vapor lock, blow-by, horsepower, vacuum, voltage, hydraulics, preventive maintenance, operator's manual, overhaul, powertrain, and P.T.O.

	Objectives	Measures
93.1	Define terms related to farm tractors.	Refer to the VEG-AG-C/TIB 7033, pp. 189-190.
93.2	Illustrate terms using a farm tractor.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 94: The learner will describe the differences in both a gasoline, and a diesel engine.

	Objectives	Measures
94.1	Compare a gasoline and a diesel engine.	Refer to the VEG-AG-C/TIB 7033, pp. 191-192.
94.2	Identify parts of a gasoline and a diesel engine.	
94.3	List the functions of engine parts.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 95: The learner will describe fuels and lubricants used in internal combustion engines.

	Objectives	Measures
95.1	Describe fuels and lubricants used in internal combustion engines.	Refer to the VEG-AG-C/TIB 7033, pp. 193-194.
95.2	Define cetane and octane ratings for fuels used in internal combustion engines.	
95.3	Identify contaminants in motor oil.	
95.4	Select proper engine fuel or lubricant for a specific job.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 96: The learner will describe systems used in the transmission of power.

Objectives	Measures
96.1 Trace the power train from motor to wheels.	Refer to the VEG-AG-C/TIB 7033, pp. 195-196.
96.2 Make clutch adjustments.	
96.3 Select belts for a belt-driven power train.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 97: The learner will identify types of bearings.

	Objectives	Measures
97.1	Identify the different types of bearings used in tractors.	Refer to the VEG-AG-C/TIB 7033, pp. 197-198.

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 98: The learner will prepare a preventative maintenance schedule and perform maintenance jobs for a tractor.

	Objectives	Measures
98.1	Prepare a preventative maintenance schedule.	Refer to the VEG-AG-C/TIB 7033, pp. 199-200.
98.2	Use an operator's manual to set up preventative maintenance schedule.	
98.3	Label a diagram of parts of tractor that need maintenance at 5, 10, and 50 hours.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 99: The learner will describe and practice precautions for safe use of tractors.

	Objectives	Measures
99.1	**Describe precautions for safely operating a tractor.**	**Refer to the VEG-AG-C/TIB 7033, pp. 201-202.**
99.2	**Safely operate a tractor.**	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 100: The learner will remove, clean, and pack wheel bearings correctly.

Objectives		Measures
100.1	Remove wheel bearings.	Refer to the VEG-AG-C/TIB 7033, pp. 203-204.
100.2	Clean wheel bearings.	
100.3	Pack wheel bearings.	
100.4	Install wheel bearings.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 101: The learner will change oil and oil filters and service all points needing lubrication in a tractor.

	Objectives	Measures
101.1	Change the crankcase oil and oil filters in a tractor.	Refer to the VEG-AG-C/TIB 7033, pp. 205-206.
101.2	Lubricate all tractor grease fittings.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 102: The learner will tune a tractor engine.

Objectives		Measures
102.1	Change plugs in a tractor.	Refer to the VEG-AG-C/TIB 7033, pp. 207-208.
102.2	Change points in a tractor.	
102.3	Set the timing of a tractor.	
103.4	Visually inspect a tractor for oil and air leaks.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 103: The learner will adjust the clutch and brakes on a tractor.

Objectives		Measures
103.1	Adjust a clutch.	Refer to the VEG-AG-C/TIB 7033, pp. 209-210.
103.2	Lubricate a clutch.	
103.3	Adjust brakes.	
103.4	Bleed brake lines.	

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AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 104: The learner will adjust valve tappets in a tractor engine.

Objectives		Measures
104.1	Check valve tappets.	Refer to the VEG-AG-C/TIB 7033, pp. 211-212.
104.2	Adjust valve tappets.	
104.3	Use torque wrench.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 105: The learner will service all types of air cleaners in farm machinery.

Objectives	Measures
105.1 Remove air filters.	Refer to the VEG-AG-C/TIB 7033, pp. 213-214.
105.2 Clean air filters.	
105.3 Identify types of air filters.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 106: The learner will adjust the carburetor properly.

Objectives		Measures
106.1	Identify types of carburetors.	Refer to the VEG-AG-C/TIB 7033, pp. 215-216.
106.2	Identify carburetor adjustments.	
106.3	Name parts of carburetor.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 107: The learner will service fuel system.

Objectives		Measures
107.1	Check fuel system for leaks.	Refer to the VEG-AG-C/TIB 7033, pp. 217-218.
107.2	Clean parts of fuel system.	
107.3	Replace parts of fuel system.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 108: The learner will check and service a battery correctly.

Objectives		Measures
108.1	Check a battery for specific gravity.	Refer to the VEG-AG-C/TIB 7033, pp. 219-220.
108.2	Add water to battery.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 109: The learner will interpret Federal and State employment regulations for agricultural occupations.

	Objectives	Measures
109.1	Identify laws and regulations related to employment in agriculture.	Refer to the VEG-AG-C/TIB 7033, pp. 221-222.
109.2	Explain employment policies spelled out in the rules and regulations.	
109.3	List hazardous occupations found in agriculture.	

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AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 110: The learner will make a groove weld and run a bead in the overhead position.

Objectives		Measures
110.1	Make a groove weld.	Refer to the VEG-AG-C/TIB 7033, pp. 223.
110.2	Run a bead in the overhead position.	
110.3	Select proper electrodes for running a bead and overhead welding.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 111: The learner will build up worn parts using the electric arc welder.

Objectives	Measures
111.1 Figure the cost of building up worn parts.	Refer to the VEG-AG-C/TIB 7033, pp. 224-225.
111.2 Select electrodes for hard-surfacing.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 112: The learner will operate a metal gas (MIG) welder.

Objectives		Measures
112.1	Weld by the MIG process.	Refer to the VEG-AG-C/TIB 7033, pp. 226-227.
112.2	Operate a MIG welder.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 113: The learner will operate a tungsten insert gas (TIG) welder.

Objectives	Measures
113.1 Set up equipment for TIG welding.	Refer to the VEG-AG-C/TIB 7033, pp. 228-229.
113.2 Weld two pieces of metal by TIG welding.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 114: The learner will weld cast iron.

	Objectives	Measures
114.1	Weld cast iron together properly.	Refer to the VEG-AG-C/TIB 7033, pp. 230-231.
114.2	Select the appropriate electrodes for welding cast iron.	
114.3	Identify cast iron.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 115: The learner will braze cast iron.

Objectives	Measures
115.1 Select materials for brazing.	Refer to the VEG-AG-C/TIB 7033, p. 232.
115.2 Adjust welder for brazing.	
115.3 Braze two pieces of 2" x 3" cast iron.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 116: The learner will hard surface a plowshare or other tillage tool.

Objectives		Measures
116.1	Select hard-surfacing materials.	Refer to the VEG-AG-C/TIB 7033, p. 233.
116.2	Hard-surface a plowshare.	
116.3	Adjust welder for hard-surfacing.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 117: The learner will run vertical bead.

Objectives		Measures
117.1	Adjust welder for vertical welds.	Refer to the VEG-AG-C/TIB 7033, p. 234.
117.2	Run a 2" bead in vertical position.	

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AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 118: The learner will run overhead bead.

Objectives	Measures
118.1 Adjust welder for overhead welding.	Refer to the VEG-AG-C/TIB 7033, p. 235.
118.2 Run a 2" bead overhead.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 119: The learner will maintain a hydraulic system in proper operating condition.

Objectives		Measures
119.1	Check hydraulic system for leaks.	Refer to the VEG-AG-C/TIB 7033, pp. 236-237.
119.2	Identify basic hydraulic system troubles.	
119.3	Drain, flush, and refill a hydraulic system.	
119.4	Replace fittings on a hydraulic system.	
19.5	Prepare a maintenance schedule for a hydraulic system.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 120: The learner will disassemble, repair, and reassemble tractor engines.

	Objectives	Measures
120.1	Use engine testing equipment.	Refer to the VEG-AG-C/TIB 7033, pp. 238-240.
120.2	Disassemble a farm tractor engine.	
120.3	Reassemble a farm tractor engine.	
120.4	Determine fixed cost of a tractor.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 121: The learner will service PTO drive.

Objectives		Measures
121.1	Service the PTO.	Refer to the VEG-AG-C/TIB 7033, pp. 241-243-245.
121.2	Remove and replace guards on the PTO.	
121.3	Attach equipment to the PTO.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 122: The learner will repair or replace the clutch, brakes, and pressure plate.

	Objectives	Measures
122.1	Adjust a pressure plate.	Refer to the VEG-AG-C/TIB 7033, p. 244.
122.2	Remove and replace a clutch and/or clutch pressure plate.	
122.3	Adjust brakes.	
122.4	Repair brake linings.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 123: The learner will identify the advantages of automation and mechanization.

	Objectives	Measures
123.1	Determine labor saved by uses of labor-saving devices.	Refer to the VEG-AG-C/TIB 7033, pp. 246-247.
123.2	Determine time saved due to automation.	
123.3	Compute money saved through the use of automation.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 124: The learner will describe the types of electrical controls used on the farm.

Objectives		Measures
124.1	Identify electrical controls.	Refer to the VEG-AG-C/TIB 7033, pp. 248-249.
124.2	Describe how electrical controls work.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/ Equipment/Structures

COMPETENCY GOAL 125: The learner will evaluate and select materials, handling equipment, and mechanized forest equipment.

	Objectives	Measures
125.1	Determine when a labor-saving device should be purchased.	Refer to the VEG-AG-C/TIB 7033, pp. 250-251.
125.2	Weigh the advantages of one labor-saving device over another.	
125.3	Identify safety procedures to follow.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 126: The learner will install a thermostat, pressure switch, timer, fuse, circuit breaker, and voltage regulator safely and accurately.

	Objectives	Measures
126.1	Determine whether an electrical control device is needed.	Refer to the VEG-AG-C/TIB 7033, pp. 252-253.
126.2	Select proper tools for installing electrical controls.	
126.3	Follow safety procedures in installing electrical controls.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 127: The learner will describe selected electrical terms correctly including: single phase, 3-phase, voltmeter, ammeter, volts, amperes, capacity start, repulsion, start, fuse, and short-circuit.

Objectives		Measures
127.1	Define selected electrical terms.	Refer to the VEG-AG-C/TIB 7033, pp. 254-255.
127.2	Demonstrate the use of a voltmeter and an ammeter.	
127.3	Identify single-phase and three-phase current by the number of wires coming into a house.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 128: The learner will identify types of electric motors and describe their uses.

Objectives		Measures
128.1	Identify types of electric motors.	Refer to the VEG-AG-C/TIB 7033, pp. 256-257.
128.2	List the characteristics of each type of electric motor.	
128.3	List the uses of each type of electric motor.	
128.4	Select an electric motor to fit a specific job.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 129: The learner will describe the accessories and protective devices used on electrical motors.

	Objectives	Measures
129.1	Identify accessories and protective devices on electric motors.	Refer to the VEG-AG-C/TIB 7033, pp. 258-259.
129.2	Select accessories for a given job.	
129.3	Tell what an accessory or protective device does.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 130: The learner will describe the information given on labels attached to motors.

	Objectives	Measures
130.1	Identify the symbols on an electric motor label.	Refer to the VEG-AG-C/TIB 7033, p. 260.
130.2	Select an electric motor for a given job by the name plate.	
130.3	Draw and correctly label a motor name plate.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 131: The learner will describe drives used connecting motors to machines.

Objectives		Measures
131.1	Identify electric motor drives.	Refer to the VEG-AG-C/TIB 7033, p. 261-263.
131.2	List two uses of each electric motor drive.	
131.3	Select the best drive for a given job.	
131.4	Select pulleys and belts for a given job.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 132: The learner will describe how to determine which size motor to use for a specific job.

	Objectives	Measures
132.1	Select an electric motor for a specific job.	Refer to the VEG-AG-C/TIB 7033, pp. 264-265.
132.2	Select an electric motor to replace a gasoline engine and tractor PTO.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 133: The learner will identify parts of an electric motor.

Objectives		Measures
133.1	Identify motor parts.	Refer to the VEG-AG-C/TIB 7033, p. 266.
133.2	Describe function of motor parts.	
133.3	Disassemble electric motor and label its parts.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 134: The learner will identify the advantages of an electric motor.

Objectives		Measures
134.1	List the advantages of electric motors.	Refer to the VEG-AG-C/TIB 7033, pp. 267-268.
134.2	Compare electric motors to gasoline engines.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/ Equipment/Structures

COMPETENCY GOAL 135: The learner will alter an electric motor to enable it to operate on 120 V or 240 volts.

	Objectives	Measures
135.1	Read name plate on an electric motor to determine voltage.	Refer to the VEG-AG-C/TIB 7033, pp. 269-270.
135.2	Change motor wires in order to change voltage requirements.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 136: The learner will install brushes in an electric motor.

Objectives		Measures
136.1	Remove brushes from motor.	Refer to the VEG-AG-C/TIB 7033, pp. 271-272
136.2	Clean commutator.	
136.3	Fit brushes to commutator.	
136.4	Install brushes in electric motor.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 137: The learner will reverse direction of rotation in an electric motor.

Objectives		Measures
137.1	Identify methods of reversing electric motors.	Refer to the VEG-AG-C/TIB 7033, pp. 273-274.
137.2	Reverse an electric motor.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 138: The learner will determine proper size pulleys to use on the motor and equipment for a given job.

Objectives		Measures
138.1	Identify types of V-pulleys.	Refer to the VEG-AG-C/TIB 7033, p. 275.
138.2	Calculate size pulleys needed.	
138.3	Use pulley and belt chart.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 139: The learner will check the voltage on a line serving as a motor.

	Objectives	Measures
139.1	Use voltmeter to check voltage on a line.	Refer to the VEG-AG-C/TIB 7033, pp. 276-277.
139.2	Use a test light to determine voltage on a line.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 140: The learner will install bearings in an electric motor.

Objectives		Measures
140.1	Identify types of bearings used in an electric motor.	Refer to the VEG-AG-C/TIB 7033, pp. 278-279.
140.2	Remove bearings.	
140.3	Install bearings.	
140.4	Lubricate bearings.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 141: The learner will clean the commutator.

	Objectives	Measures
141.1	Clean commutator of electric motor.	Refer to the VEG-AG-C/TIB 7033, pp. 280-281.
141.2	Select proper materials to clean commutator.	

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AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 142: The learner will clean and service a motor.

Objectives		Measures
142.1	Disassemble motor.	Refer to the VEG-AG-C/TIB 7033, pp. 282-283.
142.2	Select cleaning methods and materials to clean motor parts.	
142.3	Clean and service motor parts.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/ Equipment/Structures

COMPETENCY GOAL 143: The learner will calculate the belt length for a given set of motor pulleys and equipment pulleys.

	Objectives	Measures
143.1	Identify types of V-belt.	Refer to the VEG-AG-C/TIB 7033, p. 284.
143.2	Calculate length of belt needed.	
143.3	Determine number of belts needed for a given job.	

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AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 144: The learner will define the following terms used with agricultural equipment: calibrate, operator's manual, custom work, draft (plows), furrow, back furrow, and hydrostatic drive.

Objectives		Measures
144.1	Define terms related to tillage, combining, planting, spraying, and dusting of crops.	Refer to the VEG-AG-C/TIB 7033, pp. 285-286.
144.2	Use a machine operator's manual to define terms related to that particular machine.	

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Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 145: The learner will recognize the principal parts of agricultural machinery.

	Objectives	Measures
145.1	Point out and identify major parts of a bottom plow, disc, combine, planter, duster, and sprayer.	Refer to the VEG-AG-C/TIB 7033, pp. 287-288.
145.2	Identify adjustment parts on farm machinery.	
145.3	Identify parts used to promote safety on farm machinery.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 146: The learner will recognize hazards and describe safety precautions to follow when using equipment.

Objectives		Measures
146.1	List safety precautions to follow in using planters, tillage machinery, harvesters, combines, dusters, and sprayers.	Refer to the VEG-AG-C/TIB 7033, pp. 289-290.
146.2	Point out and describe uses of safety equipment attached to farm machinery.	
146.3	List hazards to watch for when using farm machinery.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 147: The learner will describe the advantages and disadvantages of custom contracting versus owning equipment.

Objectives		Measures
147.1	Define custom contracting.	Refer to the VEG-AG-C/TIB 7033, pp. 291-292.
147.2	List advantages and disadvantages of custom contracting.	
147.3	Compare cost of custom work versus owning equipment.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 148: The learner will identify "fixed" and "variable" costs.

Objectives		Measures
148.1	List fixed costs related to farm machinery.	Refer to the VEG-AG-C/TIB 7033, pp. 293-294.
148.2	List variable costs related to farm machinery.	
148.3	Define "fixed" and "variable" cost.	

VOCATIONAL EDUCATION
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Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 149: The learner will demonstrate a knowledge of the principles of operation of agricultural chemical, planting and tillage, harvest, and soil and water conservation equipment.

	Objectives	Measures
149.1	List steps necessary in getting a specific piece of machinery used in the community ready for operation.*	Refer to the VEG-AG-C/TIB 7033, pp. 295-296
149.2	List necessary steps for operating a specific piece of machinery safely.*	
149.3	Identify adjustments parts used in operating farm machinery.*	
149.4	List operations or jobs a piece of machinery can perform.*	

*Check only if utilized in the instructional program:

Agricultural chemical equipment--sprayers, dusters, foggers, fumigating equipment, and fertilizer distributors.

Planting and tillage equipment--row crop planters, broadcast and drill planters; moldboard disk, rotary, chisel, and subsurface plows.

Harrows--spike tooth, disk, spring tooth land roller, soil pulverizer, cultivator, weeder, and manure spreader.

Harvest equipment--combiner, hay baler, hay racker, tobacco harvester, potato digger, cotton picker, hay conditioner, and forage harvesting equipment.

Soil and water conservation equipment--terracing blade, tree planter, and other soil or water conservation equipment.

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Grade Level: 10-12 Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 150: The learner will use an operator's manual to select a replacement part, to lubricate, to make adjustments on, and to make repairs for selected agricultural equipment.

Objectives		Measures
150.1	Select a replacement part.	Refer to the VEG-AG-C/TIB 7033, pp. 297-298.
150.2	Lubricate various pieces of equipment.	
150.3	Make adjustments to equipment.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 151: The learner will calibrate a sprayer boom to get the desired pattern.

	Objectives	Measures
151.1	Calibrate a sprayer to apply a given amount of spray material per acre.	Refer to the VEG-AG-C/TIB 7033, pp. 299-300.
151.2	List steps in calibrating a sprayer.	
151.3	Identify adjustments needed to calibrate a sprayer.	

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Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 152: The learner will fill out a sales slip correctly.

Objectives		Measures
152.1	Complete a sales slip.	Refer to the VEG-AG-C/TIB 7033, pp. 301-302.
152.2	List items on a sales slip.	
152.3	Compute the amount of tax to add to a sale.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 153: The learner will enter information on a stock record card accurately.

	Objectives	Measures
153.1	Determine number of an item on hand from a stock record card.	Refer to the VEG-AG-C/TIB 7033, pp. 303-304.
153.2	Make an entry in a stock record card when an item is purchased or sold.	
153.3	List items to be included on a stock record card.	

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AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 154: The learner will make an inventory and complete an inventory form in a parts department.

Objectives		Measures
154.1	Make a list of assets in a parts department.	Refer to the VEG-AG-C/TIB 7033, pp. 305-306.
154.2	Make a list of liabilities in a parts department.	
154.3	Compute the total value of several items at a given price.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 155: The learner will determine the slope of land using a farm level.

Objectives	Measures
155.1 Identify types of survey instruments and equipment.	Refer to the VEG-AG-C/TIB 7033, pp. 307-308.
155.2 Identify the parts of a farm level.	
155.3 Set up the level for work.	
155.4 Read the scale of an engineer's rod.	
155.5 Calculate percent slope given rise and run.	
155.6 Measure the slope between two given points.	

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Grade Level: 10-12   Skills/Subject Area: Agricultural Machinery/ Equipment/Structures

COMPETENCY GOAL 156: The learner will locate and run a terrace using a farm level.

Objectives		Measures
156.1	Determine when a terrace is needed.	Refer to the VEG-AG-C/TIB 7033, pp. 309-310.
156.2	Identify the location of needed terraces.	
156.3	Lay out a terrace using a farm level.	

Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 157: The learner will lay out a piece of land for strip cropping.

	Objectives	Measures
157.1	Discuss the purpose of and uses for strip cropping.	Refer to the VEG-AG-C/TIB 7033, pp. 311-312.
157.2	Lay out contour strips on a field.	

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Grade Level: 10-12

Skills/Subject Area: Agricultural Machinery/Equipment/Structures

COMPETENCY GOAL 158: The learner will set up an irrigation system to irrigate an acre of land.

	Objectives	Measures
158.1	Identify parts of an irrigation system.	Refer to the VEG-AG-C/TIB 7033, pp. 313-314.
158.2	Space irrigation pipe and sprinklers for proper field coverage.	
158.3	Prime an irrigation pump.	

Agricultural Production I Outline

1. Leadership/FFA

    a. Parliamentary procedure
    b. Public speaking
    c. Supervised occupational experience

2. Animal Science

    a. Feed nutrients for farm animals
    b. Breeding farm animals
    c. Disposing of animal carcasses
    d. Fitting and showing farm animals

3. Soil Science

    a. Classification of soils
    b. Measuring crop land
    c. Interpreting soil sample reports
    d. Nutrient requirements and utilization for farm crops

4. Agricultural Chemicals

    a. Controlling weeds in crops
    b. Applying pesticides safely

5. Welding with Electric Arc Welder

    a. Cutting and boring with the electric arc welder
    b. Hard-surfacing with the electric arc welder
    c. Making simple repairs on farm machinery

6. Hand Tools

    a. Using hand tools safely
    b. Sharpening hand tools

7. Farm Tractors

    a. Operating the farm tractor safely
    b. Routine maintenance of the farm tractor

8. Laying Off Foundations with Stakes and Batter Boards

Agricultural Production II Outline

1. Animal Science
    a. Selecting and evaluating livestock
    b. Feeding farm animals
    c. Function of the digestive system of farm animals
    d. Housing farm animals
    e. Controlling internal and external parasites
    f. Identifying plants that are harmful to farm animals
    g. Health regulations on shipping farm animals

2. Crop Science
    a. Controlling common crop insects
    b. Identification and control of plant diseases
    c. The effect of nematodes on crop yield
    d. Plant nutrient deficiencies in agricultural crops
    e. Reading a soil map
    f. Drying and storing grain

3. Farmstead Maintenance
    a. Mixing, pouring, and finishing concrete
    b. Planning a plumbing job for the farm business
    c. Installing plumbing fixtures
    d. Selecting and installing electrical fixtures and outlets
    e. Following safety precautions while working with electricity
    f. Repairing farm machinery and equipment
    g. Controlling the tractor under varying field conditions

Agricultural Production III Outline

1. Animal Science
    a. Identifying common farm animal diseases
    b. Treating diseases and parasites of farm animals
    c. Balancing rations for farm animals
    d. Reproducing life cycle of swine intestinal roundworm

2. Crops and Soils
    a. Cultural practices to follow in producing farm crops
    b. Controlling soil erosion on the farm

3. Farm Business Management
    a. Overhead and operating costs of farm enterprise
    b. Analyzing the farm business
    c. Business law common to farmers
    d. Inventorying the farm business

    e. Preparing a net worth statement
    f. Marketing farm products
    g. Planning a farm layout
    h. Keeping farm records
    i. Preparing farm taxes
    j. Storing farm crops
    k. Borrowing money to operate a farm
    l. Utilization of farm labor

4. Farmstead Maintenance

    a. Preparing a bill of materials
    b. How the hydraulic system works
    c. Maintenance of the tractor and farm machinery
    d. Construction and repairing small farm buildings

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 1: The learner will preside over chapter and committee meetings of the FFA.

	Objectives	Measures
1.1	Possess a current knowledge of FFA activities so that organizational structure can be carried out effectively.	Refer to the VEG-AG-C/TIB 7013, pp. 7-8.
1.2	Be familiar with the different committees in FFA.	
1.3	Have a working knowledge of duties and responsibilities of different FFA officers.	
1.4	Demonstrate the ability to preside over FFA chapter and committee meetings.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 2: The learner will correctly perform six rules of parliamentary procedure.

Objectives	Measures
2.1 Define "parliamentary procedure."	Refer to the VEG-AG-C/TIB 7013, pp. 9-10.
2.2 List five reasons for the use of parliamentary procedure.	
2.3 Demonstrate the correct use of at least six rules of parliamentary procedure.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 3: The learner will prepare and present a five minute speech.

	Objectives	Measures
3.1	Prepare a speech related to agriculture or FFA.	Refer to the VEG-AG-C/TIB 7013, pp. 11-12.
3.2	Deliver a prepared speech in the classroom or in a public situation.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 4: The learner will make an inventory of assets and liabilities.

	Objectives	Measures
4.1	Define "assets" and "liabilities."	Refer to the VEG-AG-C/TIB 7013, pp. 13-14.
4.2	Determine the net worth of an individual.	
4.3	Define the term "inventory."	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 5: The learner will enter income, expenses, and work performed in a record book.

	Objectives	Measures
5.1	Prepare a financial statement.	Refer to the VEG-AG-C/TIB 7013, pp. 15-16.
5.2	Make entries of receipts and expenses in a farm record book.	
5.3	Analyze production records.	
5.4	Make agricultural production entries in a farm record book.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 6: The learner will describe the functions of the feed nutrients for farm animals.

Objectives		Measures
6.1	List six major classes of nutrients.	Refer to the VEG-AG-C/TIB 7013, pp. 17-18.
6.2	Describe the major function of each class of nutrients.	
6.3	Identify three sources of each nutrient.	

VOCATIONAL EDUCATION
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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 7: The learner will determine the age at which to start service of a given male animal.

	Objectives	Measures
7.1	Identify major parts of male and female reproductive organs.	Refer to the VEG-AG-C/TIB 7013, pp. 19-20.
7.2	Describe the growth patterns and maturity ages of breeding animals.	
7.3	List two methods of breeding farm animals.	
7.4	Identify and describe the major systems of livestock breeding.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 8: The learner will select the correct method of disposing of an animal carcass.

	Objectives	Measures
8.1	Develop a knowledge of local and state laws governing the disposal of animal carcasses.	Refer to the VEG-AG-C/TIB 7013, pp. 20-22.
8.2	Identify sanitary disposal methods for animal carcasses.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 9: The learner will clean and trim an animal in preparation for show.

	Objectives	Measures
9.1	List the age and weight classes of beef cattle, swine, and dairy cattle used for shows.	Refer to the VEG-AG-C/TIB 7013, pp. 22-23.
9.2	Describe five recommended grooming procedures for show animals.	

VOCATIONAL EDUCATION
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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 10: The learner will feed and care for animal during a fair.

	Objectives	Measures
10.1	Develop a feeding program for a show animal during the show.	Refer to the VEG-AG-C/TIB 7013, pp. 24-26.
10.2	List three major factors to consider in animal care at a fair or show.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 11: The learner will explain and perform approved showmanship techniques.

Objectives		Measures
11.1	List four rules of the ring for show animals.	Refer to the VEG-AG-C/TIB 7013, pp. 26-28.
11.2	Demonstrate the techniques of showmanship.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 12: The learner will identify different soils as they occur in fields.

Objectives		Measures
12.1	Identify different soils in the school community.	Refer to the VEG-AG-C/TIB 7013, p. 29.

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 13: The learner will correctly list the land capability classes and recommended use for agricultural purposes.

Objectives		Measures
13.1	List the correct land capability classes.	Refer to the VEG-AG-C/TIB 7013, pp. 30-31.
13.2	Recommend correct use of the land for agricultural purposes.	
13.3	Recommend proper management practices to use on the farm.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 14: The learner will demonstrate the ability to measure crop land.

Objectives		Measures
14.1	Measure agricultural land accurately.	Refer to the VEG-AG-C/TIB 7013, p. 32.
14.2	Select a piece of property and determine the acreage.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 15: The learner will interpret a soil sample report for a given crop.

	Objectives	Measures
15.1	Explain and discuss the procedure for collecting soil samples.	Refer to the VEG-AG-C/TIB 7013, pp. 33-35.
15.2	Take a good soil sample, package it, fill out the information sheet, and mail it to the soil testing service.	
15.3	Interpret the soil test results received from the testing service.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 16: The learner will calculate, in units per acre, the nutrients required for a specified crop.

Objectives		Measures
16.1	Calculate the units of primary nutrients needed per acre on agricultural crops.	Refer to the VEG-AG-C/TIB 7013, pp. 36-37.

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 17: The learner will describe environmental conditions which effect the utilization of nutrients.

Objectives	Measures
17.1 Determine the proper pH for agricultural crops.	Refer to the VEG-AG-C/TIB 7013, pp. 38-39.
17.2 Determine the proper soil drainage for crops.	
17.3 Determine the proper soil characteristics for certain crops.	
17.4 Determine optimum conditions for growing specified crops.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 18: The learner will classify weeds according to life cycle.

	Objectives	Measures
18.1	Identify weed annuals, biennials, and perennials.	Refer to the VEG-AG-C/TIB 7013, pp. 40-41.
18.2	Identify ten common weeds found in the community.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 19: The learner will select, and correctly apply a herbicide for common weeds in crops.

	Objectives	Measures
19.1	Describe four methods for applying herbicides and recommend the correct one for a specific situation.	Refer to the VEG-AG-C/TIB 7013, pp. 41-42.
19.2	Calculate the amount of a given herbicide to be used per acre.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 20: The learner will follow safety procedures while applying pesticides.

Objectives	Measures
20.1 Identify four types of pesticides.	Refer to the VEG-AG-C/TIB 7013, pp. 43-44.
20.2 Select the proper pesticide for the job.	
20.3 Read a pesticide label and follow the instructions.	
20.4 Properly apply pesticides following all rules and regulations.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 21: The learner will bore a hole in metal with arc-welder.

	Objectives	Measures
21.1	Select proper operating temperature and set the temperature (amperage) adjustments on the arc-welder.	Refer to the VEG-AG-C/TIB 7013, pp. 45-46.
21.2	Select the proper electrode for various metal types and sizes.	
21.3	Identify various metal types and sizes.	
21.4	Use proper safety precautions when welding.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 22: The learner will hard surface a tillage tool.

Objectives	Measures
22.1 Describe reasons for hard-surfacing.	Refer to the VEG-AG-C/TIB 7013, p. 47.
22.2 Prepare a tillage tool for hard-surfacing.	
22.3 Demonstrate the proper method for hard-surfacing tillage tools.	
22.4 Select the proper materials for hard-surfacing operations.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 23: The learner will make repairs on simple farm equipment.

	Objectives	Measures
23.1	Recognize worn or damaged parts of simple farm machinery.	Refer to the VEG-AG-C/TIB 7013, pp. 48-49.
23.2	Demonstrate how to repair specific items on disc harrows, plows, cultivators, and mowers.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 24: The learner will follow safety rules while using farm hand tools.

	Objectives	Measures
24.1	Illustrate ten safety practices to follow in using farm hand tools.	Refer to the VEG-AG-C/TIB 7013, p. 50.
24.2	Illustrate safe storage of farm hand tools.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 25: The learner will demonstrate proficiency in sharpening farm hand tools.

	Objectives	Measures
25.1	List and describe reasons for keeping hand tools in good operating condition.	Refer to the VEG-AG-C/TIB 7013, p. 51.
25.2	Demonstrate how to sharpen common hand tools found in farm shops.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 26: The learner will attach a plow to the tractor.

	Objectives	Measures
26.1	Demonstrate how to attach a plow to the tractor in a safe manner.	Refer to the VEG-AG-C/TIB 7013, pp. 52-53.

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 27: The learner will make the necessary alignment and draft adjustments to a tractor.

Objectives		Measures
27.1	Demonstrate how to set upper and lower link adjustments on a three-point hitch system.	Refer to the VEG-AG-C/TIB 7013, pp. 54-55.
27.2	Point out the different draft adjustment levers and demonstrate the function of each.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 28: The learner will mount equipment on the tractor.

Objectives	Measures
28.1 Demonstrate how to attach various tractor-mounted equipment to a three-point hitch.	Refer to the VEG-AG-C/TIB 7013, pp. 56-57.
28.2 Demonstrate how to couple wheel-mounted equipment to the hydraulic system and hitch it to the tractor drawbar.	
28.3 List and describe safety procedures to follow when mounting equipment to the tractor.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 29: The learner will perform routine maintenance on tractors and machinery according to an operating manual.

	Objectives	Measures
29.1	Understand the importance of keeping the tractor in safe operating condition.	Refer to the VFG-AG-C/TIB 7013, pp. 58-59.
29.2	Identify and check out potential problems.	
29.3	Perform regular routine maintenance on the farm tractor.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 30: The learner will remove and install safety shield on PTO.

Objectives	Measures
30.1 Describe the importance of the PTO shield.	Refer to the VEG-AG-C/TIB 7013, pp. 60-61.
30.2 Install a PTO shield on a tractor.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 31: The learner will assemble materials for stakes and batter boards.

	Objectives	Measures
31.1	Determine the amount of material needed for a given job.	Refer to the VEG-AG-C/TIB 7013, pp. 62-63.
31.2	Survey and stake off foundations with stakes and batter boards.	
31.3	Construct stakes and batter boards with the materials.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 32: The learner will sort and grade feeder livestock through the use of visual aids or live animals.

Objectives	Measures
32.1 List the major grades of feeder livestock.	Refer to the VEG-AG-C/TIB 7013, pp. 64-65.
32.2 Place feeder livestock in the correct grade.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 33: The learner will sort and grade "finished" animals for market using the score cards.

	Objectives	Measures
33.1	List the major grades for "finished" livestock.	Refer to the VEG-AG-C/TIB 7013, pp. 66-67.
33.2	Place "finished" livestock in the correct grade.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 34: The learner will describe which roughages and concentrates are used for a specific farm animal.

Objectives		Measures
34.1	List two major types of feed materials.	Refer to the VEG-AG-C/TIB 7013, pp. 68-70.
34.2	Identify three sources of roughages and three sources of concentrates.	
34.3	Plan a feeding program for a specified animal using roughages and/or concentrates.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 35: The learner will describe the feed systems commonly used on the farm.

	Objectives	Measures
35.1	List and describe the various systems of feeding farm animals.	Refer to the VEG-AG-C/TIB 7013, pp. 70-72.

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 36: The learner will explain the parts and functions of the digestive system of farm animals.

Objectives		Measures
36.1	List the major parts of the digestive system for swine, cattle, and poultry.	Refer to the VEG-AG-C/TIB 7013, pp. 72-74.
36.2	Describe the function of major parts of the digestive system for swine, cattle, and poultry.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 37: The learner will determine the housing needs for various kinds of farm animals.

Objectives		Measures
37.1	Identify farm buildings, fences, and equipment for farm animals.	Refer to the VEG-AG-C/TIB 7013, pp. 74-75.
37.2	List and explain two methods of waste disposal.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 38: The learner will describe three methods of preventing external and internal parasites in farm animals.

	Objectives	Measures
38.1	Identify three external, and three internal parasites commonly found in farm animals.	Refer to the VEG-AG-C/TIB 7013, pp. 76-77.
38.2	Describe three methods of preventing parasites.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 39: The learner will identify poisonous plants growing in the local community which are harmful to farm animals.

	Objectives	Measures
39.1	Identify five plants which are harmful to farm animals.	Refer to the VEG-AG-C/TIB 7013, pp. 78-80.
39.2	List two methods of eliminating poisonous plants.	
39.3	Describe symptoms of animals who have eaten two different types of poisonous plants.	
39.4	Describe treatment procedures for animal poisoning due to poisonous plant ingestion.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 40: The learner will explain the health regulations regarding the shipping of farm animals.

	Objectives	Measures
40.1	List two reasons a health certificate is required for shipping breeding swine.	Refer to the VEG-AG-C/TIB 7013, pp. 80-82.
40.2	Identify three items of information that must be on a shipping notice.	
40.3	Identify three items of information that must be on a health certificate.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 41: The learner will describe common crop insects and signs of these insects that are found in the local community.

Objectives		Measures
41.1	Identify at least five insects which affect agricultural crops in her/his community.	Refer to the VEG-AG-C/TIB 7013, pp. 83-84.
41.2	Describe at least three methods of insect control.	
41.3	List and explain at least five sources of information for controlling insects.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 42: The learner will determine the economic loss due to insect damage.

	Objectives	Measures
42.1	**Determine the economic loss and damage caused by insects on specified crops in a local community.**	Refer to the VEG-AG-C/TIB 7013, pp. 85-86.

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 43: The learner will describe common plant diseases and the symptoms of affected crops grown in the local community.

	Objectives	Measures
43.1	Identify at least three diseases affecting agricultural plants found in her/his community.	Refer to the VEG-AG-C/TIB 7013, pp. 87-88.
43.2	List and explain five sources of information on controlling plant or crop diseases.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 44: The learner will describe at least four methods of controlling major plant diseases.

Objectives	Measures
44.1 Describe at least four methods of plant disease control.	Refer to the VEG-AG-C/TIB 7013, pp. 89-90.

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 45: The learner will identify major plant nutrient deficiencies and list methods for correcting them.

Objectives	Measures
45.1 Recognize primary plant nutrient deficiencies.	Refer to the VEG-AG-C/TIB 7013, pp. 91-93.
45.2 Recognize secondary plant nutrient deficiencies.	
45.3 Recognize micronutrient plant deficiencies.	
45.4 Recognize the main nutrient deficiencies found in major North Carolina crops.	
45.5 Correct plant nutritional deficiencies.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 46: The learner will demonstrate the ability to read soil maps and interpret the terms and symbols on the maps.

	Objectives	Measures
46.1	Read a soil map and make the necessary interpretations.	Refer to the VEG-AG-C/TIB 7013, pp. 93-94.

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 47: The learner will identify various methods for drying grain.

Objectives		Measures
47.1	Develop a working knowledge of the different methods available for drying grain.	Refer to the VEG-AG-C/TIB 7013, pp. 95-97.
47.2	Describe the advantages and disadvantages of each type of grain drying unit.	
47.3	Develop an understanding of the different types of grain storage bins and equipment.	
47.4	Select the proper drying and storage system to best meet individual needs.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 48: The learner will finish a concrete job.

	Objectives	Measures
48.1	Remove the air pockets from poured concrete.	Refer to the VEG-AG-C/TIB 7013, pp. 97-98.
48.2	Select a desired finish commensurate with the use of the poured concrete.	
48.3	Demonstrate how to use trowels, floats, and other concrete finishing tools.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 49: The learner will calculate quantities of concrete materials for a given job.

	Objectives	Measures
49.1	Determine the amount of concrete needed and its cost for any given job.	Refer to the VEG-AG-C/TIB 7013, pp. 99-100.

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 50: The learner will lay out forms for pouring concrete for a given job.

	Objectives	Measures
50.1	Measure and cut forms with the necessary tools.	Refer to the VEG-AG-C/TIB 7013, pp. 101-102.
50.2	Mold the form so as to obtain desired slope or flatness.	
50.3	Construct and install forms on the area to be poured.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 51: The learner will mix and pour concrete for a given job.

	Objectives	Measures
51.1	Identify materials used to make concrete and know how to select them.	Refer to the VEG-AG-C/TIB 7013, pp. 103-104.
51.2	List and describe the proper ratio of said materials.	
51.3	Demonstrate proper mixing procedures for small concrete jobs.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 52: The learner will determine the amount of pipe necessary to install a specific water line on a farm.

Objectives	Measures
52.1 Select the kind of pipe needed for the project.	Refer to the VEG-AG-C/TIB 7013, pp. 105-107.
52.2 Select the proper supply-pipe size.	
52.3 Determine the amount of pipe needed for a specific job.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 53: The learner will plan a plumbing job on a specific farmstead.

	Objectives	Measures
53.1	Plan the location of outside water outlets.	Refer to the VEG-AG-C/TIB 7013, pp, 107-108.
53.2	Plan the piping outlay.	
53.3	Recognize and plan for the protection of plumbing pipe.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 54: The learner will perform simple plumbing tasks on a farmstead.

	Objectives	Measures
54.1	Recognize the safety hazards involved in installing and repairing plumbing.	Refer to the VEG-AG-C/TIB 7013, pp. 109-111.
54.2	Select materials needed to install plumbing.	
54.3	Select materials needed to repair plumbing systems.	
54.4	Install and repair plumbing systems.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 55: The learner will define the following electrical terms: circuit, power source, insulators, conductors, volt, ampere, watt, alternating current, direct current, kilowatt, kilowatt hour, and single phase.

	Objectives	Measures
55.1	Define various terms associated with electricity.	Refer to the VEG-AG-C/TIB 7013, pp. 111-112.
55.2	Describe what electricity is and how it is generated.	
55.3	Read a meter and compute the cost of electricity.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 56: The learner will select electrical hardware commonly used on the farmstead.

	Objectives	Measures
56.1	Identify various electrical devices used on the farmstead and explain their purpose.	Refer to the VEG-AG-C/TIB 7013, pp. 113-114.
56.2	Select the various electrical devices needed for a specific job.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 57: The learner will repair an extension cord in accordance with the latest electrical code.

	Objectives	Measures
57.1	Splice wires together in accordance with the latest electrical code.	Refer to the VEG-AG-C/TIB 7013, pp. 115-116.
57.2	Select the appropriate wire connectors and use them properly.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 58: The learner will make simple repairs on electrical circuits.

Objectives	Measures
58.1 Recognize damaged or defective electrical devices.	Refer to the VEG-AG-C/TIB 7013, pp. 117-118.
58.2 Replace damaged or defective devices.	
58.3 Describe how fuses and circuit breakers work, and replace them, selecting the appropriate size and type.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 59: The learner will install electrical switches, receptacles, and fuses.

Objectives		Measures
59.1	Plan a wiring job for a farm building.	Refer to the VEG-AG-C/TIB 7013, pp. 119-120.
59.2	Install and maintain a permanent wiring system.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 60: The learner will follow safe procedures while working with electricity.

	Objectives	Measures
60.1	Recognize the hazards involved in performing electrical repairs.	Refer to the VEG-AG-C/TIB 7013, pp. 121-122.

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 61: The learner will recognize the hazards involved in butt and fillet welding.

Objectives		Measures
61.1	Recognize the hazards involved in butt and fillet welding.	Refer to the VEG-AG-C/TIB 7013, p. 123.
61.2	Understand the procedures for making butt and fillet welds.	
61.3	Develop competency in making butt and fillet welds.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 62: The learner will demonstrate proficiency while welding in horizontal, as well as vertical, positions.

	Objectives	Measures
62.1	Recognize the hazards involved in making horizontal and vertical welds.	Refer to the VEG-AG-C/TIB 7013, pp. 124-125.
62.2	Understand the procedures for making horizontal and vertical welds.	
62.3	Develop competency in making horizontal and vertical welds.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 63: The learner will demonstrate the ability to control the tractor under varying field conditions.

Objectives		Measures
63.1	Recognize the hazards involved in operating a farm tractor.	Refer to the VEG-AG-C/TIB 7013, pp. 126-127.
63.2	Know the leading causes of tractor accidents.	
63.3	Operate a farm tractor safely.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 64: The learner will describe the common diseases of farm animals.

	Objectives	Measures
64.1	Identify two major diseases common to each type of farm animal in the community.	Refer to the VEG-AG-C/TIB 7013, pp. 128-129.
64.2	Describe the symptoms of two contagious diseases, and two noncontagious diseases found in farm animals.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 65: The learner will explain the treatment for the common diseases of farm animals.

	Objectives	Measures
65.1	Explain the importance of sanitation in animal disease prevention.	Refer to the VEG-AG-C/TIB 7013, pp. 130-131.
65.2	Describe treatment methods for two diseases found in each type of farm animal.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 66: The learner will detect and treat internal and external parasites of farm animals.

	Objectives	Measures
66.1	Identify six types of farm animal parasites.	Refer to the VEG-AG-C/TIB 7013, pp. 132-133.
66.2	Recommend a treatment program for animals infected with types of farm animal parasites.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 67: The learner will balance a ration for three different kinds of farm animals.

	Objectives	Measures
67.1	Describe the nutritional requirements for a specific farm animal.	Refer to the VEG-AG-C/TIB 7013, pp. 134-135.
67.2	Use the square method to balance three rations for three farm animals.	
67.3	Use the trial and error method to balance three rations for two farm animals.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 68: The learner will describe the life cycle of the swine intestinal roundworm.

	Objectives	Measures
68.1	Draw and label a diagram of the life cycle of the swine roundworm.	Refer to the VEG-AG-C/TIB 7013, p. 136.
68.2	List two wormers that are recommended to treat roundworms.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 69: The learner will describe the most commonly approved method of producing major farm crops commonly grown in the community.

Objectives	Measures
69.1 Describe the cultural practices for major field crops grown in the school community.	Refer to the VEG-AG-C/TIB 7013, pp. 137-139.
69.2 Identify the types of equipment used in cultivating agricultural field crops.	
69.3 List five ways in which weeds get started.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 70: The learner will prepare a plan to control erosion on a specific farm.

	Objectives	Measures
70.1	Identify the three types of soil water and tell which one is used by plants.	Refer to the VEG-AG-C/TIB 7013, pp. 140-141.
70.2	Describe the four factors affecting the water holding capacity of soils.	
70.3	Recommend methods for conserving soil water.	
70.4	Recommend methods for protecting soil from wind erosion.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 71: The learner will identify overhead and operating costs of a farm enterprise.

	Objectives	Measures
71.1	Define "fixed costs" and "variable costs."	Refer to the VEG-AG-C/TIB 7013, pp. 142-143.
71.2	Identify costs as variable or fixed.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 72: The learner will analyze a farm business in terms of the size of the business, cropping program, livestock program, financial returns, labor, power, and machinery efficiency.

Objectives	Measures
72.1 Define five economic principles used in analyzing farm businesses.	Refer to the VEG-AG-C/TIB 7013, pp. 144-145.
72.2 Devise a farm business analysis problem related to five economic principles.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 73: The learner will complete a farm business analysis and calculate measures of performance.

Objectives		Measures
73.1	Complete a profit and loss statement.	Refer to the VEG-AG-C/TIB 7013, pp. 145-147.
73.2	Compute feed efficiency and labor efficiency problems.	
73.3	Compute a problem about return on investment and one about return on net worth.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 74: The learner will define and explain: wills, life estates, farm corporations, and gift taxes.

	Objectives	Measures
74.1	Explain the importance of obeying agricultural laws.	Refer to the VEG-AG-C/TIB 7013, pp. 148-149.
74.2	Define wills, life estates, and gift and inheritance taxes.	
74.3	Compare advantages and disadvantages of three types of farm ownership.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 75: The learner will take an inventory of a farm business.

	Objectives	Measures
75.1	Understand the importance of developing a farm inventory.	Refer to the VEG-AG-C/TIB 7013, pp. 150-151.
75.2	Develop a farm inventory.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 76: The learner will prepare a net worth statement for a farm business.

Objectives	Measures
76.1 Understand the meaning of a net worth statement.	Refer to the VEG-AG-C/TIB 7013, pp. 152-154.
76.2 Develop a net worth statement.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 77: The learner will estimate and compare cost of materials needed for a specific job.

	Objectives	Measures
77.1	Develop the skills necessary for writing a bill of materials and for calculating their specifications.	Refer to the VEG-AG-C/TIB 7013, pp. 155-156.
77.2	Develop the skills needed for calculating the cost of lumber and other materials needed in the construction business.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 78: The learner will draw or sketch a typical farm layout.

Objectives		Measures
78.1	Identify the factors to be considered in establishing farm production goals.	Refer to the VEG-AG-C/TIB 7013, pp. 157-158.
78.2	Prepare a farm layout map.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 79: The learner will describe the steps involved in marketing farm products.

	Objectives	Measures
79.1	Identify and describe the methods of marketing farm products.	Refer to the VEG-AG-C/TIB 7013, pp. 159-161.
79.2	Identify the factors to consider in selecting a market for farm products.	
79.3	Analyze factors to consider in determining when to market farm products.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 80: The learner will determine the storage costs of farm products.

	Objectives	Measures
80.1	Describe the various methods of harvesting crops in the local community.	Refer to the VEG-AG-C/TIB 7013, pp. 162-163.
80.2	Determine the most efficient and economical methods of storing farm products.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 81: The learner will describe the various kinds of markets for farm products.

	Objectives	Measures
81.1	Name and describe the different types of markets available in a community.	Refer to the VEG-AG-C/TIB 7013, pp. 164-165.

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 82: The learner will describe the various factors which affect marketing of farm products.

	Objectives	Measures
82.1	Discuss how weather affects the marketing of agricultural products.	Refer to the VEG-AG-C/TIB 7013, pp. 166-167.
82.2	Explain how marketing of agricultural products relates to problems in transportation.	
82.3	Consider perishability of agricultural products as a marketing factor.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 83: The learner will describe the various kinds of records kept on the farm.

Objectives	Measures
83.1 Identify records to be kept on the farm.	Refer to the VEG-AG-C/TIB 7013, pp. 168-169.
83.2 Describe methods of keeping farm records.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 84: The learner will describe the procedure for determining property tax.

	Objectives	Measures
84.1	Understand the meaning of taxation.	Refer to the VEG-AG-C/TIB 7013, pp. 170-171.
84.2	Understand what property may be taxed.	
84.3	Understand how property is assessed.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 85: The learner will properly complete a loan application to purchase a farm.

Objectives		Measures
85.1	Learn how to fill out forms necessary for securing a loan.	Refer to the VEG-AG-C/TIB 7013. pp. 172-173.

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 86: The learner will compute interest on long and short term loans.

	Objectives	Measures
86.1	Compute interest on long, intermediate, and short term loans.	Refer to the VEG-AG-C/TIB 7013, pp. 174-175.

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 87: The learner will explain the various sources of farm credit.

Objectives		Measures
87.1	Learn where to apply for farm credit.	Refer to the VEG-AG-C/TIB 7013, pp. 176-177.
87.2	Explain the sources of financial aid for farm establishment.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 88: The learner will complete necessary forms to borrow money.

	Objectives	Measures
88.1	Fill out a form correctly in order to borrow money.	Refer to the VEG-AG-C/TIB 7013, pp. 178-179.

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 89: The learner will complete the Federal and State income tax forms common to farm operation.

	Objectives	Measures
89.1	Understand which income is taxable.	Refer to the VEG-AG-C/TIB 7013, pp. 180.
89.2	Understand which business expenses are deductible.	
89.3	Learn to figure depreciation and investment credits.	
89.4	Fill out the proper income tax forms correctly.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 90: The learner will develop a list of job priorities that can be used when a labor shortage exists.

Objectives		Measures
90.1	Manage hired labor efficiently.	Refer to the VEG-AG-C/TIB 7013, pp. 181-182.
90.2	Decide how much to invest in labor-saving equipment.	
90.3	Describe the kind of wage and benefit agreements used for farm labor.	
90.4	Prepare a work plan schedule.	

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Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 91: The learner will prepare a bill of materials for a given construction job.

	Objectives	Measures
91.1	Develop a working knowledge of the terms used in the building industry.	Refer to the VEG-AG-C/TIB 7013, pp. 183.
91.2	Develop an understanding of the different types of lumber dimensions.	
91.3	Calculate board feet.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 92: The learner will identify the major components of the hydraulic system.

Objectives	Measures
92.1 Recognize the hazards involved in servicing and maintaining a hydraulic system.	Refer to the VEG-AG-C/TIB 7013, pp. 184-185.
92.2 Understand the basic principles involved in the operation of a hydraulic system.	
92.3 Recognize, identify, and describe the uses of different types of systems.	

Grade Level: 10-12 Skills/Subject Area: Agricultural Production

COMPETENCY GOAL 93: The learner will select the correct type of oil used in the hydraulic system.

	Objectives	Measures
93.1	Understand the importance of servicing the hydraulic system by changing the oil at regular intervals.	Refer to the VEG-AG-C/TIB 7013, pp. 186-187.
93.2	Select the correct oil type as specified in the tractor or equipment owner's manual.	

Forestry I Outline

1. FFA and SOEP

    a. History and purposes of FFA
    b. Importance and use of parliamentary procedure
    c. Public speaking
    d. Planning a SOEP

2. Forestry

    a. Historical development of forestry and forestry's economic importance
    b. Multiple use forestry
    c. Employment/working in forestry

3. Technical Forestry

    a. Characteristics and growth requirements of trees
    b. Tree identification and dendrology
    c. Composition and density of forests
    d. Forest ecology
    e. Forest measurements--mensuration
    f. Forest management
    g. Siloicature
    h. Harvesting and product utilization
    i. Forest protection--fire, insects, disease

Forestry II Outline

1. Advanced Tree Identification--Dendrology

2. Timber Harvesting

    a. Environmental aspects of timber harvesting
    b. Timber acquisition
    c. Silvica hurol harvesting systems
    d. Logging systems, practices, cost analysis

3. Mensuration/Forest Measurements

    a. Land measurements
    b. Forest measurement/inventory, product measurement

4. Forest Products Marketing

    a. Product marketing
    b. Forest products processing

5. Forest Protection
    a. Fire protection
    b. Insect protection
    c. Forest diseases
6. Forest Regeneration
7. Urban Forestry

Forestry III Outline

1. Genetic Tree Improvement and Seed Production
2. Forest Nursery and Christmas Tree Production
3. Forest Inventory
    a. Deed location and mapping
    b. Advanced surveying techniques
    c. Aerial photos use and interpretation
    d. Timber cruising, mapping, and marking
4. Forestry Practicisms
    a. Logging
    b. Site preparation
    c. Prescribed burning
    d. Regeneration
    e. Forest management
5. Saw Milling, Lumber Grinding, Wood Preservation
6. Forestry Finances, Taxation, Government Assistance
7. Urban Forestry

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 1: The learner will preside over FFA chapter and committee meetings.

Objectives	Measures
1.1 Possess a current knowledge of FFA activities so that organizational structure can be carried out effectively.	Refer to the VEC-AG-C/TIB 7073, pp. 7-8.
1.2 Be familar with the different committees in FFA.	
1.3 Have a working knowledge of duties and responsibilities of various FFA officers.	
1.4 Demonstrate the ability to preside over FFA chapter and committee meetings.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 2: The learner will perform correctly six parliamentary procedure abilities.

Objectives	Measures
2.1 Define "parliamentary procedure."	Refer to the VEC-AG-C/TIB 7073, pp. 9-10.
2.2 List five reasons for the use of parliamentary procedures.	
2.3 Demonstrate correctly the use of at least six parliamentary procedure abilities.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 3: The learner will prepare and present a five-minute speech.

Objectives	Measures
3.1 Prepare a speech related to agriculture or FFA.	Refer to the VEC-AG-C/TIB 7073, pp. 11-12.
3.2 Deliver a prepared speech in the classroom or in a public situation.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 4: The learner will make an inventory of assets and liabilities.

Objectives	Measures
4.1 Define "assets" and "liabilities."	Refer to the VEC-AG-C/TIB 7073, pp. 13-14.
4.2 Determine the net worth of an individual.	
4.3 Define "inventory."	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 5: The learner will keep an up-to-date record book including expenses, receipts, work performed, and financial statement.

Objectives	Measures
5.1 Prepare a financial statement.	Refer to the VEC-AG-C/TIB 7073, pp. 15-16.
5.2 Make entries of receipts and expenses in a farm record book.	
5.3 Analyze farm production records.	
5.4 Make agricultural production entries in a farm record book.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 6: The learner will discuss the history and development of forestry in North Carolina and in the United States.

Objectives	Measures
6.1 Trace the development of forestry in the United States and in North Carolina.	Refer to the VEC-AG-C/TIB 7073, pp. 17-18.
6.2 List the functions of the State Forest Service.	
6.3 Identify three early contributors to American forestry education and conservation.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 7: The learner will describe the importance of forestry in relation to the national, state, and local economy and environment.

Objectives	Measures
7.1 Discuss the economic value of commercial forests in North Carolina and in the United States.	Refer to the VEC-AG-C/TIB 7073, pp. 19-20.
7.2 List the advantages of the southeast for forest production.	
7.3 Relate the economic significance of forestry employment in our national economy.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 8: The learner will identify and explain the concept of multiple use forestry.

	Objectives	Measures
8.1	Identify various possible uses of forest land and explain how all or combinations of these may be implemented compatibly.	Refer to the VEC-AG-C/TIB 7073, pp. 21-22.
8.2	Discuss current social, policical, and legislative trends with regard to multiple use forestry.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 9: The learner will identify occupations in forest industry and the employment requirements for each.

Objectives	Measures
9.1 Obtain employment in the forestry field.	Refer to the VEC-AG-C/TIB 7073, pp. 23-24.
9.2 Show understanding of job application procedures.	
9.3 Show understanding of how different organizations rate performance.	
9.4 Show understanding of safety procedures and survival skills necessary for forest industry jobs.	
9.5 List occupations in the forest industry in both professional and production categories.	
9.6 Identify schools with forestry training programs.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 10: The learner will identify characteristics and growth requirements of forest trees.

Objectives	Measures
10.1 Name the parts of a tree and the function of each.	Refer to the VEC-AG-C/TIB 7073, pp. 25-27.
10.2 Take an increment boring of a tree to determine its age.	
10.3 Identify types of flowers and fruit for trees common to the area.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 11: The learner will recognize trees common to local area.

Objectives	Measures
11.1 State scientific name for most trees common to the local area.	Refer to VEC-AG-C/TIB 7073, p. 28.
11.2 Identify trees on the official FFA Forestry Contest list by their leaves.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 12: The learner will explain composition and density in relation to forest management.

Objectives	Measures
12.1 Explain stand composition using major classification systems for forest trees and stands.	Refer to the VEC-AG-C/TIB 7073, p. 29.
12.2 Identify density classification of forest stands and explain the relation of density to growth.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 13: The learner will define and describe the aspects of forest ecology.

Objectives	Measures
13.1 Understand the role of trees and other green plants as producers of oxygen and food.	Refer to the VEC-AG-C/TIB 7073, p. 30.
13.2 Identify and understand man's influence on forest ecosystems.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 14: The learner will demonstrate methods of forest measurement.

Objectives	Measures
14.1 Understand terms related to surveying.	Refer to the VEC-AG-C/TIB 7073, pp. 31-33.
14.2 Use a biltmore stick to determine volume of standing trees and logs.	
14.3 Estimate land areas using a loggers' chain.	
14.4 Carry out a forest cruise.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 15: The learner will demonstrate an understanding of proper forest management techniques.

Objectives	Measures
15.1 Understand the need for a forest management plan.	Refer to the VEC-AG-C/TIB 7073, p. 36.
15.2 Understand the components of a good forest management plan.	
15.3 Understand professional services available for developing a forest management plan.	
15.4 List the possible multiple uses of forests.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 16: The learner will describe certain silvicultural regeneration systems.

Objectives	Measures
16.1 Describe silvicultural regeneration systems and factors involved in implementating them.	Refer to the VEC-AG-C/TIB 7073, p. 37-38.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 17: The learner will list intermediate silvicultural systems.

Objectives	Measures
17.1 Select the appropriate intermediate silvicultural treatments for an immature forest stand.	Refer to the VEC-AG-C/TIB 7073, pp. 39-40.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 18: The learner will identify the types of silvicultural harvesting systems.

Objectives	Measures
18.1 Identify and describe types of silvicultural harvesting systems.	Refer to the VEC-AG-C/TIB 7073, pp. 41-42.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 19: The learner will develop an understanding of logging systems, equipment, and practices.

Objectives	Measures
19.1 Explain the differences in Western, Southern, Eastern, and Lake State logging systems.	Refer to the VEC-AG-C/TIB 7073, pp. 43-44.
19.2 List basic machinery for various logging systems.	
19.3 Use a chain saw correctly and safely.	
19.4 Select the proper system to match a silvicultural objective.	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 20: The learner will identify selected forest products and their uses.

Objectives	Measures
20.1 Identify uses for forest products.	Refer to the VEC-AG-C/TIB 7073, pp. 45-46.
20.2 State the specifications required for logs to be used in selected forest products.	
20.3 Summarize processing procedures for major forest products.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 21: The learner will identify and demonstrate methods used to protect forest resources.

Objectives	Measures
21.1 Identify methods used to protect forests from fire, insects, and disease.	Refer to the VEC-AG-C/TIB 7073, pp. 48-48.
21.2 Identify forest management practices useful in protecting forests.	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 22: The learner will identify local trees by characteristics other than leaves such as bark, twigs, buds, flowers, fruit, and general shape.

Objectives	Measures
22.1 Identify trees by bark, twigs, buds, flowers, fruit, and general shape.	Refer to the VEC-AG-C/TIB 7073, p. 49.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 23: The learner will list five environmental factors to be considered in designing a logging operation.

Objectives	Measures
23.1 Identify five environmental factors to be considered in designing a logging operation.	Refer to the VEC-AG-C/TIB 7073, p. 50.
23.2 Recommend solutions to environmental problems resulting from logging.	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 24: The learner will list five important items to be included in a timber sales contract.

Objectives	Measures
24.1 List important items in a timber sales contract.	Refer to the VEC-AG-C/TIB 7073, p. 51.
24.2 Demonstrate the ability to inspect a timber sale for contract compliance.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 25: The learner will describe four methods by which timber is sold.

Objectives	Measures
25.1 Describe four methods by which timber is sold.	Refer to teh VEC-AG-C/TIB 7073, pp. 52-79.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 26: The learner will demonstrate proficiency in compass usage.

Objectives	Measures
26.1 With the aid of a compass, measure land by pacing and chaining.	Refer to the VEC-AG-C/TIB 7073, pp. 81-82.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 27: The learner will determine the acreage in a given tract by pacing and chaining.

Objectives	Measures
27.1 Determine land area using pacing and chaining.	Refer to the VEC-AG-C/TIB 7073, pp. 83-84.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 28: The learner will determine DBH in a tree using biltmore stick, diameter tape, and tree caliper.

Objectives	Measures
28.1 Measure a tree's diameter and height.	Refer to the VEC-AG-C/TIB 7073, p. 85.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 29: The learner will determine the height of a tree using a hypsometer.

Objectives	Measures
29.1 Demonstrate the use of a hypsometer.	Refer to the VEC-AG-C/TIB 7073, p. 86.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 30: The learner will calculate the volume of standing trees.

Objectives	Measures
30.1 Estimate the volume of a specific number of trees.	Refer to the VEC-AG-C/TIB 7073, p. 87.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 31: The learner will calculate the timber volume per acre on a specific forest area.

Objectives	Measures
31.1 Estimate the correct timber volume in a specific area using various methods of cruising.	Refer to the VEC-AG-C/TIB 7073, pp. 88-90.
31.2 Conduct a timber cruise and accurately determine board footage in standing trees.	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 32: The learner will calculate the volume of saw logs using the Doyle, Scribner, and International.

Objectives	Measures
32.1 Calculate and compare saw log volumes using Doyle, Scribner, and International.	Refer to the VEC-AG-C/TIB 7073, p. 91.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 33: The learner will calculate the cordage in a specific pile of pulpwood.

Objectives	Measures
33.1 Calculate cords in a pile of pulpwood.	Refer to the VEC-AG-C/TIB 7073, p. 92.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 34: The learner will determine the number of board feet in a specific pile of lumber.

Objectives	Measures
34.1 Determine the number of board feet in a pile of lumber.	Refer to the VEC-AG-C/TIB 7073, p. 93.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 35: The learner will write a forest management plan for a specific forest area.

Objectives	Measures
35.1 Demonstrate knowledge of basic components of a forest management plan and forest management practices.	Refer to the VEC-AG-C/TIB 7073, p. 94.
35.2 Write a forest management plan for a given forest area.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 36: The learner will calculate the number of pine seedlings needed to reforest five acres.

Objectives	Measures
36.1 Determine the number of seedlings needed per acre at a specified spacing.	Refer to the VEC-AG-C/TIB 7073, p. 95.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 37: The learner will demonstrate the ability to care for and plant pine seedlings.

Objectives	Measures
37.1 Demonstrate methods for seedling care prior to planting.	Refer to the VEC-AG-C/TIB 7073, p. 95.
37.2 Demonstrate proper procedure for planting seedlings.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 38: The learner will determine and plan the appropriate intermediate treatments for a specific forested area.

Objectives	Measures
38.1 Demonstrate knowledge of intermediate forest treatments and their applications.	Refer to the VEC-AG-C/TIB 7073, p. 96.
38.2 Prescribe appropriate intermediate forest treatments for a forest area based on evaluation of silvicultural, economic, and environmental factors.	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 39: The learner will describe the appropriate uses of major silvicultural harvesting systems.

Objectives	Measures
39.1 Demonstrate knowledge of major silvicultural harvesting systems and their applications.	Refer to the VEC-AG-C/TIB 7073, p. 97.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 40: The learner will determine an appropriate logging system for a projected logging site.

Objectives	Measures
40.1 Develop a logging system for a specific site based on a specified set of conditions.	Refer to the VEC-AG-C/TIB 7073, p. 98.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 41: The learner will demonstrate proficiency in servicing and sharpening a chain saw.

Objectives	Measures
41.1 Service and sharpen a chain saw.	Refer to the VEC-AG-C/TIB 7073, pp. 99-100.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 42: The learner will demonstrate a knowledge of hydraulic systems.

Objectives	Measures
42.1 Demonstrate a knowledge of hydraulic systems.	Refer to the VEC-AG-C/TIB 7073, pp. 101-102.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 43: The learner will identify servicing points and operating parts of a skidder.

Objectives	Measures
43.1 Identify servicing points and operating parts of a skidder.	Refer to the VEC-AG-C/TIB 7073, p. 103.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 44: The learner will identify servicing points and operating parts of a loader.

Objectives	Measures
44.1 Identify the servicing points and operating parts of a loader.	Refer to the VEC-AG-C/TIB 7073, p. 104.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 45: The learner will discuss various types of hauling vehicles which transport forest raw materials to a mill.

Objectives	Measures
45.1 Discuss various types of vehicles for hauling logs.	Refer to the VEC-AG-C/TIB 7073, p. 105.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 46: The learner will determine proficiency in safe felling, bucking, skidding, and loading.

Objectives	Measures
46.1 Fell a tree safely.	Refer to the VEC-AG-C/TIB 7073, p. 107.
46.2 Buck a tree into logs.	
46.3 Skid and load logs.	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 47: The learner will prepare a cost analysis for a specific piece of logging equipment.

Objectives	Measures
47.1 Calculate the fixed cost and variable cost of equipment in an average logging operation.	Refer to the VEC-AG-C/TIB 7073, pp. 108-126.
47.2 Use a worksheet to determine the total cost for equipment in an average logging operation.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 48: The learner will determine the best marketing method for a specific forest product.

Objectives	Measures
48.1 Determine the best marketing method for a group of trees.	Refer to the VEC-AG-C/TIB 7073, p. 127.
48.2 Identify local markets for forest products.	
48.3 Mark a tree for bucking into logs for each type of forest product.	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 49: The learner will describe the processing procedure for various forest products.

Objectives	Measures
49.1 Identify numerous products from the forest.	Refer to the VEC-AG-C/TIB 7073, p. 128.
49.2 Discuss the process involved in preparing these products for market.	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 50: The learner will demonstrate an understanding of fire behavior.

Objectives	Measures
50.1 Name the three parts of the fire triangle.	Refer to the VEC-AG-C/TIB 7073, p. 129.
50.2 List sources of heat which may start forest fires.	
50.3 Identify three means of heat transfer.	
50.4 Discuss weather and topographical influences on forest fires.	

VOCATIONAL EDUCATION
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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 51: The learner will develop a fire prevention plan with appropriate equipment for a given situation.

Objectives	Measures
51.1 Develop a fire prevention plan for a given forest situation.	Refer to the VEC-AG-C/TIB 7073, p. 130.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 52: The learner will lay out and prepare a fire lane.

Objectives	Measures
52.1 Lay out a fire lane.	Refer to the VEC-AG-C/TIB 7073, p. 131.
52.2 Use hand tools to construct a fire lane.	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 53: The learner will identify forest insects, their damage, and proper control methods.

Objectives	Measures
53.1 Identify major forest insects of economic importance.	Refer to the VEC-AG-C/TIB 7073, pp. 132-133.
53.2 Demonstrate knowledge of major forest insects, their damage, and control methods.	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 54: The learner will identify forest diseases, their damage, and proper control methods.

Objectives	Measures
54.1 Identify major forest diseases of economic importance.	Refer to the VEC-AG-C/TIB 7073, p. 134.
54.2 Demonstrate knowledge of major forest diseases, their damage, and control methods.	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 55: The learner will outline the various aspects of urban forestry.

Objectives	Measures
55.1 Select appropriate trees and their location in an urban setting based on silvicultural, economic, and environmental factors.	Refer to the VEC-AG-C/TIB 7073, p. 135.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 56: The learner will list ten characteristics used in selecting genetically superior trees.

Objectives	Measures
56.1 Explain the basic inheritance theory and how it relates to genetic improvement of forests.	Refer to the VEC-AG-C/TIB 7073, p. 137.
56.2 Summarize steps in development of genetically superior trees including selection, crossing, and progeny testing.	
56.3 Describe characteristics used for selecting superior parent trees.	
56.4 Summarize the advantages of genetically superior trees.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 57: The learner will describe the production and care of a seed orchard.

Objectives	Measures
57.1 Collect scion material.	Refer to the VEC-AG-C/TIB 7073, p. 138.
57.2 Lay out and plant root stock for an orchard.	
57.3 Perform grafting procedures.	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 58: The learner will demonstrate proficiency in collecting, extracting, processing, and storing mature seeds.

Objectives	Measures
58.1 Collect and extract cones.	Refer to the VEC-AG-C/TIB 7073, p. 139.
58.2 Store and process seeds properly.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 59: The learner will outline the activities involved in the production of forest tree seedlings.

Objectives	Measures
59.1 Identify seed sources for forest nurseries.	Refer to the VEC-AG-C/TIB 7073, p. 140.
59.2 Describe sowing and planting procedures.	
59.3 Describe cultural procedures during seedling growth.	
59.4 Describe seedling lifting methods.	
59.5 Describe packing and handling of seedlings.	
59.6 Identify common pests and diseases of forest tree seedlings.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 60: The learner will lay out a Christmas tree plantation in a manner which will facilitate management.

Objectives	Measures
60.1 Select financially and biologically appropriate species for various sites and market situations.	Refer to the VEC-AG-C/TIB 7073, pp. 141-142.
60.2 Grid the layout of a Christmas tree plantation and calculate the number of trees needed per acre.	
60.3 Demonstrate the proper methods for the following techniques: a. site preparation b. seedling care and planting c. fertilizer selection and application d. diagnosis and treatment of insects and disease e. shaping a tree by shearing f. harvesting and packaging trees for market g. protection from fire, insects, and disease.	
60.4 Prepare an account ledger for a Christmas tree production operation.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 61: The learner will identify the species of Christmas trees in the local region and indicate their characteristics and market potential.

Objectives	Measures
61.1 List all species of trees commonly grown for Christmas trees.	Refer to the VEC-AG-C/TIB 7073, pp. 141-142.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 62: The learner will perform a deed search and mapping practicum.

Objectives	Measures
62.1 Identify past and present owners of a tract of land.	Refer to the VEC-AG-C/TIB 7073, pp. 143-144.
62.2 Locate past and present deeds for a tract of land.	
62.3 Complete a plot of a tract of land using protractor mapping of metes and bounds from a land deed.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 63: The learner will demonstrate proficiency in boundary line surveying using surveying instruments.

Objectives	Measures
63.1 Perform a boundary survey within acceptable accuracy standards set by the instructor.	Refer to the VEC-AG-C/TIB 7073, pp. 145-146.
63.2 Perform all computations for above survey.	
63.3 Describe the legal aspects of land surveying.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 64: The learner will demonstrate the ability to locate corresponding aerial photographs for a specific area.

Objectives	Measures
64.1 Locate corresponding aerial photographs for a specific area.	Refer to the VEC-AG-C/TIB 7073, p. 147.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 65: The learner will use stereoscopic aerial photographs to identify forest types, structures, and topography.

Objectives	Measures
65.1 Identify various forest types and natural features using aerial photographs.	Refer to the VEC-AG-C/TIB 7073, p. 148.
65.2 Identify basic forest structures.	
65.3 Properly use stereoscope and arrange photographs for stereoscopic viewing.	
65.4 Identify topographic features.	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 66: The learner will complete a timber cruise including all calculations.

Objectives	Measures
66.1 Demonstrate a knowledge of basic sampling theory.	Refer to the VEC-AG-C/TIB 7073, p. 149.
66.2 Prepare an accurate forest type map and interpret forest type maps.	
66.3 Cruise a tract of timber using strip, plot, or point cruising techniques.	
66.4 Complete calculations for each type cruise resulting in an acceptable estimation of timber volume.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 67: The learner will explain characteristics used in marking cut-leave trees for thinning or harvest.

Objectives	Measures
67.1 Describe positive and negative characteristics used in marking cut-leave trees for thinning or harvest.	Refer to the VEC-AG-C/TIB 7073, p. 150.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 68: The learner will mark a stand of timber for thinning to a proper basal area.

Objectives	Measures
68.1 Mark a stand of timber for thinning to a specified basal area.	Refer to the VEC-AG-C/TIB 7073, p. 151.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 69: The learner will perform a logging operation using available equipment.

Objectives	Measures
69.1 Perform tasks involved in a logging operation efficiently and safely.	Refer to the VEC-AG-C/TIB 7073, p. 152.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 70: The learner will identify sawmill components and their placement.

Objectives	Measures
70.1 Design and draw a diagram showing the equipment and its placement in a modern sawmilling operation.	Refer to the VEC-AG-C/TIB 7073, p. 153.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 71: The learner will perform satisfactorily each task involved in sawmilling.

Objectives	Measures
71.1 Perform satisfactorily each task in the sawmilling operation.	Refer to the VEC-AG-C/TIB 7073, p. 154.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 72: The learner will demonstrate an understanding of grading standards by grading a pile of lumber.

Objectives	Measures
72.1 Grade lumber.	Refer to the VEC- AG-C/TIB 7073, p. 155.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 73: The learner will demonstrate how to stack lumber for air or kiln drying.

Objectives	Measures
73.1 Stack lumber for air or kiln drying.	Refer to the VEC-AG-C/TIB 7073, p. 156.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 74: The learner will describe the methods of wood preservation.

Objectives	Measures
74.1 Describe the qualities of various wood preservatives.	Refer to the VEC-AG-C/TIB 7073, p. 157.
74.2 Name the treatment processes used for wood preservation.	
74.3 Prepare a piece of wood for treatment.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 75: The learner will prepare a financial and taxation statement for a hypothetical forestry operation.

Objectives	Measures
75.1 List important items in a forestry financial and taxation statement.	Refer to the VEC-AG-C/TIB 7073, p. 158.
75.2 Prepare a finance and tax statement for a forestry operation.	

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 76: The learner will list and describe available government forestry assistance programs.

Objectives	Measures
76.1 List and describe available government forestry assistance programs.	Refer to the VEC-AG-C/TIB 7073, p. 159.
76.2 Outline the procedure for application and implementation of the United States Forestry Incentives program and the United States Agricultural Conservation program.	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 77: The learner will plan and execute a forest management prescription.

Objectives	Measures
77.1 Prescribe proper forest management practices for a tract of forest land based on evaluation of environmental, silvicultural, and economic factors.	Refer to the VEC-AG-C/TIB 7073, p. 160.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 78: The learner will prepare a specific forest site for regeneration using available equipment.

Objectives	Measures
78.1 Analyze conditions on a forest site prior to regeneration and recommend the best site preparation method.	Refer to the VEC-AG-C/TIB 7073, p. 161.
78.2 Carry out recommended site preparation practices when possible.	

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 79: The learner will plan and execute a prescribed burn on a given forest site.

Objectives	Measures
79.1 Plan and take part in execution of a prescribed burn.	Refer to the VEC-AG-C/TIB 7073, p. 162.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 80: The learner will organize, train, and supervise a tree planting crew.

Objectives	Measures
80.1 Organize, train, and supervise a tree planting crew.	Refer to the VEC-AG-C/TIB 7073, p. 163.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 81: The learner will select appropriate trees and their location in an urban setting.

Objectives	Measures
81.1 Produce a landscape plan for an urban area, using appropriate tree species.	Refer to the VEC-AG-C/TIB 7073, p. 164.

Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 82: The learner will list urban environmental factors affecting tree growth and survival.

Objectives	Measures
82.1 Demonstrate ability to diagnose and treat insect, disease, and environmentally related tree problems in urban settings.	Refer to VEC-AG-C/TIB 7073, p. 165.

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Grade Level: 10-12 Skills/Subject Area: Forestry

COMPETENCY GOAL 83: The learner will demonstrate proper tree climbing and surgical techniques.

Objectives	Measures
83.1 Safely and effectively perform certain tree surgical and removal techniques.	Refer to the VEC-AG-C/TIB 7073, p. 166.

Homestead and Gardening Skills Outline

1. Agriculture/Agribusiness
    a. An overview
    b. Its importance in economy
    c. Need for agricultural education

2. FFA and SOEP
    a. History and purposes of FFA
    b. The local FFA program of activities
    c. Planning a SOEP
    d. Keeping SOEP records

3. Homestead Planning
    a. Factors to consider
    b. Components of a homestead plan
    c. Lawns and grasses
    d. Shrubs and plants
    e. Fruit and nut production

4. Homestead and Gardening Mechanics
    a. Hand tools, sprayers, dusters
    b. Mowers, tractors, tillers
    c. Electricity
    d. Plumbing
    e. Carpentry, fences gates
    f. Concrete
    g. Paints

5. Home Safety
    a. Storage of supplies, fuels, chemicals
    b. Safe use of chemicals
    c. Safety practices in and around home

6. Home Gardens
    a. Economics and other values
    b. Factors in planning
    c. Selecting site
    d. Soil samples
    e. Insects and diseases
    f. Harvesting, storing, marketing

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 1: The learner will identify the major areas in the agriculture/agribusiness industry.

Objectives	Measures
1.1 Identify the major areas of the agriculture/agribusiness industry.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.
1.2 Identify the objectives for vocational agriculture.	

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 2: The learner will list six ways agriculture is important to the economy of the state and nation.

Objectives	Measures
2.1 Describe the importance of agriculture in the economy of the state and nation.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

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Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 3: The learner will identify five factors that have an influence on agriculture.

Objectives	Measures
3.1 Explain factors which have an influence on agriculture.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 4: The learner will trace farm products from the farmer to the consumer and identify cost factors in each area.

Objectives		Measures
4.1	Identify where farm products originate and and follow their path to the consumer.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 5: The learner will identify and discuss major reasons why Agricultural Education is important.

	Objectives	Measures
5.1	Understand and explain the importance of Agricultural Education.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 6: The learner will identify the history and structure of the FFA organization.

Objectives	Measures
6.1 Demonstrate a knowledge of the FFA history and its structure.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 7: The learner will identify six aims and purposes of the FFA.

Objectives	Measures
7.1 Identify the aims and purposes of the FFA.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

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Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 8: The learner will identify six activities to be included in a local FFA program of activities that will help meet individual chapter, school, and community needs.

Objectives	Measures
8.1 Describe the different functional committees of the FFA.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 9: The learner will conduct a business session using recommended parliamentary procedures.

Objectives	Measures
9.1 Demonstrate the ability to preside over a chapter or committee business session.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

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Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 10: The learner will plan and implement a supervised occupational experience program (SOEP).

Objectives	Measures
10.1 Present a knowledge and understanding of the importance of SOEP. 10.2 Plan and expand a personal SOEP.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
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Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 11: The learner will maintain appropriate records on each type of supervised occupational experience program.

Objectives	Measures
11.1 Demonstrate supervised occupational experience program record keeping.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 12: The learner will list factors to consider in planning the homestead site.

Objectives	Measures
12.1 Consider various factors in planning a homestead site.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 13: The learner will identify the components and draw a plan for the homestead considering the physical factors of the site.

Objectives		Measures
13.1	Recognize and use drawing instruments.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.
13.2	Read and understand a landscape plan.	
13.3	Design a landscape plan including public, private, and service areas.	

VOCATIONAL EDUCATION
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Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 14: The learner will identify and select lawn grasses and ground covers.

Objectives	Measures
14.1 Select grasses and ground covers for the lawn.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

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AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 15: The learner will establish the home lawn.

Objectives	Measures
15.1 Plan the home lawn.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.
15.2 Prepare the home lawn.	
15.3 Establish the home lawn.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 16: The learner will schedule and perform lawn maintenance duties including fertilization, mowing, and pest control.

Objectives	Measures
16.1 Perform correct lawn maintenance duties.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.
16.2 Fertilize a lawn.	
16.3 Mow a lawn.	
16.4 Control lawn pests.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 17: The learner will identify and select appropriate shrubs and trees for the homestead based upon their appearance and use.

Objectives	Measures
17.1 Identify at least fifty trees and shrubs used for home landscaping in North Carolina.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be use for certain competencies at the present time.
17.2 Select appropriate shrubs for areas of landscaping.	

VOCATIONAL EDUCATION
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Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 18: The learner will plant shrubs and trees properly for the homestead site.

Objectives		Measures
18.1	Plant shrubs and trees correctly.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be use for certain competencies at the present time.
18.2	Choose the correct season for planting.	
18.3	Prepare soil according to recommendations for specific plants.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 19: The learner will perform shrub and tree maintenance activities, including fertilization, pruning, and pest control.

Objectives	Measures
19.1 Apply fertilizer.	A test item bank will be developed during 1984-85. Some test items from Ornamental horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.
19.2 Prune a shrub or tree.	
19.3 Control pests on shrubs and trees.	
19.4 Stake and guy wire one or more trees.	

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Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 20: The learner will select fruit and nut plants for home use.

Objectives	Measures
20.1 Choose specific fruit and nut plants.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

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Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 21: The learner will establish and maintain fruit and nut plants for the homestead considering planting, pruning, and pest control methods.

Objectives	Measures
21.1 Establish and maintain fruit and nut plants for the homestead.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

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Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 22: The learner will identify, describe, and perform harvesting and handling methods of fruits and nuts for home use.

Objectives	Measures
22.1 Harvest and prepare fruits and nuts for home use.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

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AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 23: The learner will identify and select appropriate floral plants for the homestead based upon their appearance and use.

Objectives	Measures
23.1 Identify annual, biennial, and perennial floral plants for the homestead. 23.2 Select appropriate plants for the homestead.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 24: The learner will incorporate flowers into the homestead and maintain them properly.

Objectives	Measures
24.1 Install flowers in the homestead.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.
24.2 Maintain flowers in the homestead.	

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 25: The learner will identify and select appropriate house plants for the homestead.

Objectives	Measures
25.1 Identify appropriate house plants.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.
25.2 Select appropriate house plants.	

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Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 26: The learner will grow and maintain house plants.

Objectives	Measures
26.1 Grow house plants.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.
26.2 Maintain house plants.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 27: The learner will identify tools needed in the homestead and garden.

Objectives	Measures
27.1 Select the proper tool for the homestead or garden task to be performed.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and structures can be used for certain competencies at the present time.
27.2 Use each tool safely and correctly.	

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AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 28: The learner will demonstrate the safe and correct use of homestead and gardening tools.

Objectives	Measures
28.1 Demonstrate the ability to sharpen and repair hand and power tools and use them a safe manner.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 29: The learner will demonstrate the safe and correct procedure for maintenance and storage of hand and power tools.

Objectives	Measures
29.1 Practice correct maintenance and storage of hand and power tools.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 30: The learner will determine the proper size and type of lawn mower for various lawn needs.

Objectives	Measures
30.1 Select the size and type of lawn mower for the lawn.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

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VOCATIONAL EDUCATION
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Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 31: The learner will list five safety rules for lawn mower use.

Objectives	Measures
31.1 List the safety rules for lawn mower operation.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 32: The learner will demonstrate the correct use of lawn mowers.

Objectives	Measures
32.1 Use the lawn mower properly and safely.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

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VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 33: The learner will perform basic lawn mower maintenance jobs.

Objectives	Measures
33.1 Perform maintenance and simple repairs of lawn mowers.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

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Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 34: The learner will prepare and properly store a lawn mower.

Objectives	Measures
34.1 Properly prepare and store a lawn mower.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 35: The learner will determine the proper size and type of garden tractors and tillers for various garden needs.

Objectives	Measures
35.1 Select the size and type of garden tractor according to garden needs.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 36: The learner will list five safety rules for garden tractors and tillers.

Objectives	Measures
36.1 List the safety rules for various garden tractors and tillers.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
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Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 37: The learner will demonstrate the correct use of garden tractors and tillers.

Objectives	Measures
37.1 Use garden tractor and tillers properly and safely.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 38: The learner will perform basic maintenance on garden tractors and tillers.

Objectives	Measures
38.1 Perform maintenance and simple repairs on garden tractors and tillers.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 39: The learner will describe the proper storage of the garden tractor and tiller.

Objectives	Measures
39.1 Properly store garden tractors and tillers.	**A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.**

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 40: The learner will define and describe the use of basic electrical terms.

Objectives	Measures
40.1 **Define and describe the use of the following electrical terms: current, amperes, volts, watts, alternating current, direct current, conductor, insulator resistor, ohms, current cycle, and horsepower.**	**A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.**

VOCATIONAL EDUCATION
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Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 41: The learner will acquire basic safety procedures for working with electricity.

Objectives	Measures
41.1 List and demonstrate safety precautions when repairing electric cords, switches, receptacles, appliances, and other electrical items.	**A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.**

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 42: The learner will select electrical repair parts and appropriate tools.

Objectives	Measures
42.1 Determine appropriate tools and parts for electrical repairs.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 43: The learner will make basic home electrical repairs.

Objectives	Measures
43.1 Perform needed repairs on electrical cords, receptacles, switches, and appliances.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 44: The learner will determine the proper type and size of sprayers, dusters, and granular applicators for home and garden needs.

Objectives	Measures
44.1 Select the proper type and size of sprayer, dusters, and granular applicators to use with various home and garden tasks.	A test item bank will be developed during 1984-85. Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 45: The learner will demonstrate the safe and proper use of sprayers, dusters, and granular applicators.

Objectives	Measures
45.1 Safely and properly use sprayers, dusters, and granular applicators.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 46: The learner will adjust and calibrate sprayers, dusters, and granular applicators.

Objectives	Measures
46.1 Properly adjust and calibrate sprayers, dusters, and granular applicators for use on various jobs.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 47: The learner will make minor repairs and perform maintenance on sprayers, dusters, and granular applicators.

Objectives	Measures
47.1 Perform maintenance and repairs on sprayers, dusters, and granular applicators.	**A test item bank will be developed during 1984-85. Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.**

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 48: The learner will describe the procedures for handling and repairing emergency plumbing problems.

Objectives	Measures
48.1 Analyze and repair emergency plumbing problems.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 49: The learner will select correct plumbing repair parts.

Objectives	Measures
49.1 Select correct plumbing repair parts.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 50: The learner will repair or replace faucets and water hoses.

Objectives	Measures
50.1 Repair or replace faucets and water hoses.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 51: The learner will open clogged drains.

Objectives	Measures
51.1 Open clogged drains.	**A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.**

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 52: The learner will make a simple drawing of a construction project.

Objectives		Measures
52.1	Have knowledge of simple drafting procedures in order to do a drawing of a construction project.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.
52.2	Make a simple drawing of a construction project.	

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 53: The learner will prepare a bill of materials for a construction project.

Objectives	Measures
53.1 Know how to prepare a bill of materials, including cost estimates for a construction project.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 54: The learner will construct trellises and other simple projects.

Objectives	Measures
54.1 Demonstrate how to construct projects such as trellises, or fences.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

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Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 55: The learner will select materials needed to make repairs.

Objectives	Measures
55.1 Properly select materials needed to make simple repairs.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 56: The learner will make minor repairs to doors, windows, or furniture.

Objectives	Measures
56.1 Make minor repairs to doors, windows, furniture, etc.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 57: The learner will list the advantages of concrete for specific areas around the home such as walks, drives, porches, and posts.

Objectives	Measures
57.1 Decide when to use concrete around the home for walks, drives, porches, and posts.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 58: The learner will calculate the amount of concrete needed for specific jobs.

Objectives	Measures
58.1 Calculate the amount of concrete needed for a specific job.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 59: The learner will identify the most economical way to purchase concrete for a given task.

Objectives	Measures
59.1 Select the most economical way to purchase concrete for a given task.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 60: The learner will identify and determine which types of fences and gates homeowners can install, and which types are best for contractors to install.

Objectives	Measures
60.1 Identify the various types of fences and gates that homeowners can install.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.
60.2 Recognize the various types of fences and gates contractors install.	

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Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 61. The learner will describe the correct procedure for installing simple fences and gates.

Objectives	Measures
61.1 Install fences and gates properly.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 62: The learner will describe conditions where paint is needed.

Objectives	Measures
62.1 Identify the conditions on a surface that would determine whether painting is needed.	**A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.**

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AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 63: The learner will describe the difference between types of finishing materials and determine which one is needed for specific jobs.

Objectives	Measures
63.1 Identify the different types of finishing materials and determine which material is needed for a specific job.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 64: The learner will prepare a surface for finishing.

Objectives	Measures
64.1 Prepare a surface upon which finishing materials will be applied.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 65: The learner will apply paint, stain, and varnishes safely and properly.

Objectives	Measures
65.1 Apply paint, stain, and varnishes to a surface correctly and safely.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 66: The learner will clean and store paint brushes and rollers properly.

Objectives	Measures
66.1 Clean and properly store paint brushes and rollers.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 67: The learner will demonstrate basic first aid skills.

Objectives	Measures
67.1 Demonstrate knowledge and skills of basic first aid for different types of poisons.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.
67.2 Demonstrate proper emergency treatment for specific types of personal injury.	
67.3 Identify and respond to extreme weather conditions and natural disasters.	
67.4 Demonstrate fire and firearm safety.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 68: The learner will identify five benefits of the home vegetable garden.

Objectives	Measures
68.1 Explain the benefits of a home vegetable garden.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 69: The learner will draw a plan for the home vegetable garden based on family size, crop preferences, and plant varieties.

Objectives	Measures
69.1 Make a drawing of an appropriate home vegetable garden for a specific situation.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 70: The learner will select the proper site for a home garden.

Objectives	Measures
70.1 Evaluate different areas as possible garden sites.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.
70.2 Determine the best site for a garden considering several locations.	

VOCATIONAL EDUCATION
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Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 71: The learner will take and interpret soil samples.

Objectives	Measures
71.1 Take soil samples and interpret the results.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.
71.2 Make correct applications to adjust soil pH as needed.	
71.3 Correctly apply chemical and organic fertilizer as required.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 72: The learner will select and obtain seeds and plant materials.

Objectives	Measures
72.1 Explain how greenhouses and cold frames are used for starting seeds.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.
72.2 Select quality seeds and transplants for the home vegetable garden.	
72.3 Grow transplants for use in the home or school garden.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 73: The learner will prepare the seed bed.

Objectives	Measures
73.1 Till and prepare a garden for seeding, using various pieces of equipment.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.
73.2 Prepare rows for a garden and apply fertilizers.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 74: The learner will seed, transplant, fertilize, and cultivate garden plants.

Objectives	Measures
74.1 Sow seeds in the garden according to recommendations. 74.2 Establish transplants according to recommendations. 74.3 Mulch and thin vegetable plants according to recommendations.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 75: The learner will identify and control garden insects.

Objectives	Measures
75.1 Identify and control garden insects according to recommendations.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 76: The learner will identify and control garden diseases.

Objectives	Measures
76.1 Identify and control garden diseases according to recommendations.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12

Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 77: The learner will identify and control garden weeds.

Objectives	Measures
77.1 Identify and control garden weeds according to recommendations.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/Equipment and Structures can be used for certain competencies at the present time.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 11 or 12 Skills/Subject Area: Homestead and Gardening Skills

COMPETENCY GOAL 78: The learner will irrigate garden plants properly.

Objectives	Measures
78.1 Properly irrigate the home garden when necessary during the year.	A test item bank will be developed during 1984-85. Some test items from Ornamental Horticulture and Agriculture Machinery/ Equipment and Structures can be used for certain competencies at the present time.

Introduction to Agriculture/Natural Resources Outline

1. Orientation and Guidance

    a. Objectives of vocational agriculture
    b. Areas of agriculture/agribusiness
    c. Opportunities and educational requirements
    d. Supervised occupational experience programs
    e. Agricultural agencies and organizations

2. Leadership/FFA

3. Agricultural Mechanics

    a. Introduction to agricultural mechanics
    b. Identifying skills needed in agricultural mechanics
    c. Tools and equipment in agricultural mechanics
    d. Materials and supplies for agricultural construction
    e. Materials used in concrete and masonry construction
    f. Using simple drawings and figuring a bill of materials
    g. Measuring, marking and sawing
    h. Generation and distribution of electricity
    i. Understanding and using electrical terms
    j. Identification of electrical circuits and controls
    k. Computing the cost of electricity
    l. Identification, care, and operation of different types of electric motors
    m. Operation and care of small gasoline engines
    n. Electric arc and oxyacetylene welding

4. Animal Science

    a. Introduction to animal science
    b. Identification, selection, and judging of major breeds of livestock and poultry
    c. Animal nutrition
    d. Structures for livestock farming
    e. Identification and control of livestock pests and diseases
    f. Marketing livestock and livestock products

5. Soil Science

    a. Planning a unit in the Supervised Occupational Experience Program (SOEP) to reflect skill development
    b. Soils and their characteristics
    c. How to collect soil samples

6. Plant Science

   a. Importance of plant science in our society
   b. Identification and classification of plants according to use and economic value
   c. The plant, its nutrient requirements and the function of its parts
   d. Methods of plant propagation
   e. Identification and control of plant diseases and insects
   f. Weeds and their control

7. Agricultural Resources and Environmental Protection

   a. Introduction to agricultural resources and environmental protection
   b. The major fish species and how they are produced in North Carolina
   c. Water--its use and characteristics
   d. Major minerals found in North Carolina
   e. Types of outdoor recreational activities available to North Carolina citizens
   f. Pollution and its control

8. Agricultural Economics

   a. Introduction to economics and its relationship to agriculture
   b. Relationship of economics to man, resources and farming
   c. Economics terms, principles, and concepts
   d. Types of markets and market structures used for selling and buying agricultural goods and services

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 1: The learner will interpret the objectives for vocational agriculture/FFA.

	Objectives	Measures
1.1	Describe the course as to its overall purpose, types of learning activities, and facilities to be used.	Refer to the VEC-AG-C/TIB 7000, pp. 7-8.
1.2	Identify the objectives of vocational agriculture.	
1.3	Interpret the objectives of vocational agriculture.	

Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 2: The learner will identify the major areas of the agriculture/agribusiness industry.

Objectives		Measures
2.1	Identify the major areas of the agriculture/agribusiness industry as taught in vocational agriculture in high school.	Refer to the VEC-AG-C/TIB 7000, pp. 9-10.

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 3: The learner will identify occupational opportunities and educational requirements for employment.

	Objectives	Measures
3.1	Identify the occupational opportunities in agriculture and agribusiness.	Refer to the VEC-AG-C/TIB 7000, pp. 11-12.
3.2	Describe the educational requirements for employment.	
3.3	Identify educational opportunities available to students preparing for agricultural occupations.	

Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 4: The learner will identify educational opportunities available to students preparing for agricultural occupations.

Objectives		Measures
4.1	Define the term Supervised Occupational Experience (SOE).	Refer to the VEC-AG-C/TIB 7000, pp. 13-14.
4.2	Identify and describe the components of a Supervised Occupational Experience Program.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 5: The learner will identify types of supervised occupational experience opportunities.

	Objectives	Measures
5.1	Identify types of Supervised Occupational Experience Programs (SOEP's) in Vocational Agriculture.	Refer to the VEC-AG-C/TIB 7000. pp. 15-16.

Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 6: The learner will develop a written, personal supervised occupational experience program plan.

Objectives	Measures
6.1 Plan a written, personal Supervised Occupational Experience Program.	Refer to the VEC-AG-C/TIB 7000, pp. 17-18.

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Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 7: The learner will identify and describe the functions of federal, state, and local agricultural agencies and organizations.

Objectives		Measures
7.1	Define agricultural agencies and organizations.	Refer to the VEC-AG-C/TIB 7000, pp. 19-20.
7.2	Describe the function of the agencies and organizations serving agriculture.	
7.3	Relate the importance of supportive agencies and organizations to agriculture.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 8: The learner will demonstrate the ability to effectively lead a group discussion for five minutes.

	Objectives	Measures
8.1	**Describe the role of the FFA organization in Vocational Agriculture.**	Refer to the VEC-AG-C/TIB 7000, p. 21.
8.2	**Describe the historical development of the FFA.**	
8.3	**Identify the aims and purposes of the FFA and be able to relate their application to Vocational Agriculture.**	
8.4	**Identify and describe ten characteristics of a leader.**	
8.5	**Describe the organizational structure of the FFA on the local, state, and national levels.**	

Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 9: The learner will identify ten parliamentary procedure rules.

Objectives	Measures
9.1 Demonstrate the ability to use ten parliamentary procedure abilities.	Refer to the VEC-AG-C/TIB 7000, pp. 22-23.

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 10: The learner will perform five rules of parliamentary procedure.

Objectives	Measures
10.1 Demonstrate the ability to perform five rules of parliamentary procedure.	Refer to the VEC-AG-C/TIB 7000, p. 24.

Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 11: The learner will identify a minimum of ten occupations in agricultural construction and mechanics.

Objectives	Measures
11.1 Describe the advantages of developing skills in agricultual mechanics.	Refer to the VEC-AG-C/TIB 7000, p. 25-26.
11.2 Identify the general objectives of agricultural mechanics.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 12: The learner will identify competencies needed to enter and advance in selected agricultural construction and mechanics occupations.

Objectives	Measures
12.1 Identify a minimum of ten occupations in the field of agricultural construction.	Refer to the VEC-AG-C/TIB 7000, pp. 27-28.
12.2 Identify competencies needed to enter and advance in selected agricultural construction and mechanics occupations.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/
Natural Resources

COMPETENCY GOAL 13: The learner will identify and describe the proper uses of tools and equipment for agricultural occupations.

Objectives	Measures
13.1 Identify tools and equipment needed for agricultural occupations.	Refer to the VEC-AG-C/TIB 7000, pp. 29-32.
13.2 Describe the uses of tools and equipment needed for agricultural occupations.	

Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 14: The learner will identify and describe the different kinds of woods, metals, and finishes used in agricultural construction and mechanics projects.

	Objectives	Measures
14.1	Identify and describe the different kinds of woods, metals, and finishes used in agricultural construction and mechanics projects.	Refer to the VEC-AG-C/TIB 7000, pp. 33-34.

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 15: The learner will identify and describe the materials used in concrete and masonry construction.

Objectives	Measures
15.1 Identify and describe the materials used in concrete construction.	Refer to the VEC-AG-C/TIB 7000, p. 35.

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/
Natural Resources

COMPETENCY GOAL 16: The learner will make simple working drawings.

Objectives	Measures
16.1 Identify the basic parts of a drawing.	Refer to the VEC-AG-C/TIB 7000, p. 36.
16.2 Make a single drawing.	

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Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 17: The learner will compute accurately a bill of materials for a construction project.

Objectives	Measures
17.1 Compute accurately a bill of materials for a construction project.	Refer to the VEC-AG-C/TIB 7000, p. 37.

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 18: The learner will measure, mark, and saw lumber to within 1/16" accuracy.

Objectives	Measures
18.1 Measure, mark, and saw a piece of lumber of a given length to 1/16" accuracy.	Refer to the VEC-AG-C/TIB 7000, p. 38.

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Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 19: The learner will identify and describe the processes involved in the generation and distribution of electricity.

Objectives	Measures
19.1 Identify the process involved in the generation and distribution of electricity.	Refer to the VEC-AG-C/TIB 7000, pp. 39-40.
19.2 Describe the process involved in the generation and distribution of electricity.	

Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 20: The learner will define the meaning and use of the following electrical terms: current, amperes, volts, watts, alternating current, direct current, conductor, insulator, resistor, circuit, cycle, and horsepower.

Objectives	Measures
20.1 Define the meaning and describe the use of the following terms: current, amperes, volts, watts, alternating current, direct current, conductor, insulator, resistor, circuit, cycle, and horsepower.	Refer to the VEC-AG-C/TIB 7000, pp. 41-42.

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 21: The learner will identify different kinds of electrical circuits and control devices.

Objectives	Measures
21.1 Identify the different kinds of circuits.	Refer to the VEC-AG-C/TIB 7000, pp. 43-44.
21.2 Identify the different kinds of control devices.	

Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 22: The learner will compute problems involving the amount and cost of electrical energy.

Objectives	Measures
22.1 Figure problems involving amperage, watts, and volts.	Refer to the VEC-AG-C/TIB 7000, p. 45.
22.2 Figure costs and amounts of electricity used for specific purposes during specified periods of time.	

Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 23: The learner will identify and describe different types of electric motors.

Objectives	Measures
23.1 Describe the principles of electric motor operations.	Refer to the VEC-AG-C/TIB 7000, pp. 46-47.
23.2 Identify the different types of electric motors.	
23.3 Describe the different types of electric motors.	
23.4 Perform simple service jobs using safe and accepted procedures.	

Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 24: The learner will identify the parts and describe the functions of the following systems in small gasoline engines: compression, ignition, carburetion, and lubrication.

Objectives	Measures
24.1 Identify the parts of the compression, ignition, carburetion, and lubrication systems in small engines.	Refer to the VEC-AG-C/TIB 7000, p. 48.
24.2 Describe the functions of the various systems in small engines.	
24.3 Perform a twenty-five hour maintenance check on small gasoline engines.	

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AGRICULTURAL EDUCATION

Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/
Natural Resources

COMPETENCY GOAL 25: The learner will make welds with electric arc and oxyacetylene welders safely and correctly.

Objectives	Measures
25.1 Relate the importance of welding-arc and oxyacetylene to modern agriculture.	Refer to the VEC-AG-C/TIB 7000, pp. 49-50.
25.2 Define "welding."	
25.3 Describe the welding processes, i.e., gas and arc.	
25.4 Set up arc welding equipment; adjust, strike arc, and run bead.	
25.5 Make simple welds uniting two flat pieces of metal.	
25.6 Set up oxyacetylene equipment, light, and adjust flame.	
25.7 Make single welds uniting two flat pieces of metal and cut one piece of metal.	

VOCATIONAL EDUCATION
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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 26: The learner will identify a minimum of ten occupations and competencies needed in animal science and the livestock industry.

Objectives	Measures
26.1 Relate the importance of animals to our society.	Refer to the VEC-AG-C/TIB 7000, pp. 51-52.
26.2 Identify a minimum of ten occupations in animal science and the livestock industry.	
26.3 Identify competencies needed to enter and advance in selected animal science and livestock occupations.	

Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 27: The learner will identify and describe the distinguished breed characteristics of beef and dairy cattle, swine, sheep, and poultry.

Objectives	Measures
27.1 Identify the major breeds of swine, dairy and beef cattle, and poultry.	Refer to the VEC-AG-C/TIB 7000, pp. 53-54.
27.2 Describe the distinguishing breed characteristics of the major breeds.	

Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 28: The learner will identify and describe the functions of nutrients essential for animal growth and development.

Objectives	Measures
28.1 Identify the functions of nutrients required for animal growth and development.	Refer to the VEC-AG-C/TIB 7000, pp. 55-56.
28.2 Describe the functions of nutrients in animal growth and development.	

Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 29: The learner will judge animals on the basis of specified criteria.

Objectives	Measures
29.1 Identify animals according to production and appearance.	Refer to the VEC-AG-C/TIB 7000, p. 57.

Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 30: The learner will identify the types of structures most commonly used to house farm animals.

Objectives	Measures
30.1 Identify the types of structures most commonly used to house farm animals.	Refer to the VEC-AG-C/TIB 7000, pp. 58-59.
30.2 Describe the types of structures most commonly used to house farm animals.	

Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 31: **The learner will identify the most common pests and diseases of animals and methods of control.**

Objectives	Measures
31.1 Identify the major diseases of farm animals.	**Refer to the VEC-AG-C/TIB 7000, pp. 60-61.**
31.2 Identify the major pests of farm animals.	
31.3 Describe control measures for pests and diseases.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 32: The learner will identify the kinds of markets available for marketing animals and animal products.

Objectives	Measures
32.1 Identify marketing as it relates to farm animals.	Refer to the VEC-AG-C/TIB 7000, pp. 62-63.
32.2 Identify the kinds of markets available for selling farm animals.	
32.3 Identify the kinds of markets available for selling animal products.	

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Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 33: The learner will identify a minimum of ten occupations available and competencies needed in the field of soil science.

Objectives	Measures
33.1 Relate the importance of soil science to agriculture.	Refer to the VEC-AG-C/TIB 7000, pp. 64-65.
33.2 Show how soil science relates to plant and animal science.	
33.3 Define major terms associated with soil science.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 34: The learner will identify the factors affecting soil formation.

Objectives	Measures
34.1 Study the factors affecting soil formation.	Refer to the VEC-AG-C/TIB 7000, pp. 66-67.

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 35: The learner will describe the various properties of soils.

Objectives	Measures
35.1 Examine the various properties of soils.	Refer to VEC-AG-C/TIB 7000, p. 68.

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 36: The learner will describe the criteria used to determine land capability classes.

Objectives	Measures
36.1 List the criteria used to determine land capability classes.	Refer to the VEC-AG-C/TIB 7000, p. 69-70.

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 37: The learner will collect soil samples for testing.

Objectives	Measures
37.1 Describe the procedures to be used in collecting soils for fertility testing.	Refer to the VEC-AG-C/TIB 7000, pp. 71-72.
37.2 Collect soil samples for testing of fertility levels.	
37.3 Interpret the results of testing.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 38: The learner will identify a minimum of ten occupations and competencies needed in the field of plant science.

Objectives	Measures
38.1 Define plant science.	Refer to VEC-AG-C/TIB 7000, pp. 73-74.
38.2 Relate the importance of plants to our daily life.	
38.3 Identify a minimum of ten occupations in the field of plant science that are found in the local area.	
38.4 Identify competencies needed to enter and advance in selected plant science occupations.	
38.5 Identify opportunities to develop skills in plant science through the SOE program.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 39: The learner will identify and classify plants according to use and economic value.

Objectives	Measures
39.1 Identify and classify plants according to use and economic value.	Refer to the VEC-AG-C/TIB 7000, pp. 75-76.

Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 40: The learner will identify primary and secondary nutrient requirements of plants.

Objectives	Measures
40.1 List the primary and secondary nutrient requirements of the plant.	Refer to the VEC-AG-C/TIB 7000, pp. 77-78.

Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 41: The learner will identify and describe the functions of the parts of plants.

Objectives	Measures
41.1 Draw a simple plant and label the parts.	Refer to the VEC-AG-C/TIB 7000, pp. 79-80.

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 42: The learner will identify and describe methods of plant reproduction.

Objectives	Measures
42.1 Perform four methods of plant reproduction.	Refer to the VEC-AG-C/TIB 7000, p. 81.

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 43: The learner will describe the advantages of using hybrids, certified seeds, and plants.

Objectives	Measures
43.1 Compare crops from hybrid and certified seeds with the same crops grown from non-hybrid seed.	Refer to the VEC-AG-C/TIB 7000, p. 82.

Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 44: The learner will identify at least five diseases and methods of disease control of plants common to the local area.

Objectives	Measures
44.1 Identify at least five plant diseases common to the local areas.	Refer to the VEC-AG-C/TIB 7000, pp. 83-84.
44.2 Describe at least three methods used to control diseases in selected plants.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 45: The learner will identify at least five insects that affect plants in the local area and describe method of insect control.

Objectives	Measures
45.1 Identify at least five insects that affect plants in the local area.	Refer to the VEC-AG-C/TIB 7000, p. 85.
45.2 Recognize the economic effect insects and diseases have on plants.	
45.3 Describe at least three methods used to control insects in selected plants.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 46: The learner will identify at least ten weeds common to the local area and describe methods of weed control.

Objectives	Measures
46.1 Identify at least ten weeds common to the local area.	Refer to the VEC-AG-C/TIB 7000, p. 86.
46.2 Describe at least three methods used to control weeds.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 47: The learner will demonstrate the ability to propagate plants using three specified methods.

Objectives	Measures
47.1 Demonstrate ability to propagate plants using three specified methods: a. leaf cuttings b. softwood cuttings c. hardwood cuttings	Refer to the VEC-AG-C/TIB 7000, p. 87.

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/
Natural Resources

COMPETENCY GOAL 48: The learner will identify a minimum of ten occupations and competencies needed in agricultural resources and environmental protection.

Objectives	Measures
48.1 Identify occupations that deal with agricultural resources.	Refer to the VEC-AG-C/TIB 7000, pp. 88-89.
48.2 Identify occupations that deal with environmental protection.	
48.3 Identify the competencies needed to enter and advance in agricultural resource careers.	
48.4 Identify the competencies needed to enter and advance in environmental protection careers.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 49: The learner will describe at least three reasons for man to conserve natural resources.

Objectives	Measures
49.1 Define agricultural resources.	Refer to the VEC-AG-C/TIB 7000, p. 90.
49.2 Explain what is meant by "environmental protection."	
49.3 Define terms associated with agricultural resources and environmental protection.	
49.4 Identify the importance of agricultural resources.	
49.5 Identify the place of environmental protection in modern agriculture.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 50: The learner will identify the major fish species in specified waterways.

Objectives	Measures
50.1 Identify the major species of fish in North Carolina waters.	Refer to the VEC-AG-C/TIB 7000, p. 91.
50.2 Identify the jobs involved in operating a fish hatchery.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 51: The learner will identify the sources and physical qualities of water.

Objectives	Measures
51.1 Identify major minerals found in the local area.	Refer to the VEC-AG-C/TIB 7000, p. 92.
51.2 Describe the uses of water in our society.	
51.3 Describe the physical characteristics of water.	

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Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 52: The learner will identify rocks and minerals found in the local area.

Objectives	Measures
52.1 Identify major minerals found in the local area.	Refer to the VEC-AG-C/TIB 7000, p. 93.
52.2 Describe where major minerals are found in North Carolina.	

Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 53: The learner will identify public demands for at least ten different types of outdoor recreational activities.

Objectives	Measures
53.1 Identify the importance of outdoor recreation.	Refer to the VEC-AG-C/TIB 7000, p. 94.
53.2 Describe ten different types of recreational activities.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/
Natural Resources

COMPETENCY GOAL 54: The learner will identify the main categories and sources of pollution.

Objectives	Measures
54.1 Define pollution.	Refer to the VEC-AG-C/TIB 7000, p. 95.
54.2 Identify the main categories of pollution.	
54.3 Identify the sources of pollution.	
54.4 Identify three ways modern agricultural practices have improved the environment.	
54.5 Identify agencies charged with pollution control.	
54.6 Describe the function of control agencies.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 55: The learner will identify at least three ways modern agricultural practices have improved the environment.

Objectives	Measures
55.1 Assess the importance of soil erosion control on land with 20% slope.	Refer to the VEC-AG-C/TIB 7000, p. 96.
55.2 Examine reforestation projects used for land conservation.	
55.3 View soil losses in the community and in contour farming practices.	

Grade Level: 9-12 Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 56: The learner will identify and describe the types of economic systems.

Objectives	Measures
56.1 Define what the term "economic" means and describe its relationship to agriculture.	Refer to the VEC-AG-C/TIB 7000, pp. 97-98.
56.2 Identify and describe the types of economic systems.	

Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 57: The learner will identify and describe the types of business organizations in a capitalistic economy.

Objectives	Measures
57.1 Identify organizations, agencies, and groups that influence American agriculture.	Refer to the VEC-AG-C/TIB 7000, p. 99.
57.2 Explain agriculture's relationship to the gross national product.	
57.3 Recognize the effects of human resources on agriculture.	
57.4 Describe the effects of natural resources on agriculture.	
57.5 Recognize the distinguishing characteristics of United States farming operations.	
57.6 Identify and describe the types of business organizations in a capitalistic economy.	

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/ Natural Resources

COMPETENCY GOAL 58: The learner will identify and define basic economic terms, principles, and concepts.

Objectives	Measures
58.1 Identify basic economic terms, principles, and concepts.	Refer to the VEC-AG-C/TIB 7000, p. 100.

Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 59: The learner will identify sources of capital for establishing and operating agricultural enterprises.

Objectives	Measures
59.1 Identify capital resources for establishing and operating agricultural enterprises.	Refer to the VEC-AG-C/TIB 7000, p. 100.

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Grade Level: 9-12

Skills/Subject Area: Introduction to Agriculture/Natural Resources

COMPETENCY GOAL 60: The learner will identify the types of markets and marketing structures used for selling and buying agricultural goods and services.

Objectives	Measures
60.1 Identify the types of markets producers use in buying and selling their goods and services.	Refer to the VEC-AG-C/TIB 7000, pp. 102-103.
60.2 Describe the structures producers use in buying and selling their goods and services.	

Natural Resources and Environmental Protection I Outline

1. Leadership/FFA

    a. Parliamentary procedure
    b. Public speaking
    c. Supervised occupational experience

2. Introduction to Agricultural Resources

    a. Importance of agricultural resources
    b. Agricultural resources occupations, careers, and skills

3. Forest Resources

    a. Benefits of forest resources
    b. Tree study
    c. Tree identification
    d. Forest management services
    e. Forest fire protection
    f. Forest diseases and insects
    g. Forest measurements

4. Wildlife Resources

    a. Fish and wildlife agencies and career opportunities
    b. Establishing and managing game fish ponds
    c. Selecting, identifying, and feeding birds and animals
    d. Safety in the hunting and harvesting of wildlife

5. Soil and Water Resources

    a. Soil formation and development
    b. Soil classification and land use evaluation
    c. Land measurements
    d. Land surveying
    e. Soil analysis
    f. Water as an agricultural resource

Natural Resources and Environmental Protection II Outline

1. Wildlife Resources

    a. Testing water quality of fish ponds, lakes, and streams
    b. Fishery resources measurements
    c. Game bird management
    d. Common pests of wildlife

2. Hunting Equipment Safety

3. Atmospheric Resources

    a. Natural processes in the atmosphere
    b. Pollution of the atmosphere
    c. Maintaining air quality
    d. Effects of air pollution

4. Water Resources

    a. Identifying water sources
    b. Water pollution and its control
    c. Water for irrigation purposes

5. Forest Management

    a. Forest insect and disease control
    b. Reforestation planning
    c. Cruising timber

Natural Resources and Environmental Protection III Outline

1. Wildlife Resources

    a. Techniques of fish culture and stocking
    b. Establishing and developing hunting preserves
    c. managing wildlife resources

2. Air Pollution Sampling

3. Water Resources

    a. Sampling and analysis of water
    b. Measurement of water demand

4. Natural Resources Used for Recreational Areas

    a. Physical factors in recreation enterprise selection
    b. Financing the enterprise
    c. Developing the plan
    d. Budgeting the enterprise
    e. Legal and safety responsibilities
    f. Public relation programs
    g. Recreational facility design
    h. Maintenance of recreational areas

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 1: The learner will preside over FFA chapter and committee meetings.

	Objectives	Measures
1.1	Possess a current knowledge of FFA activities so that organizational structure can be carried out effectively.	Refer to the VEG-AG-C/TIB 7063, pp. 11-12.
1.2	Be familiar with the different committees in FFA.	
1.3	Have a working knowledge of duties and responsibilities of various FFA officers.	
1.4	Demonstrate the ability to preside over FFA chapter and committee meetings.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 2: The learner will correctly perform six parliamentary procedure abilities.

	Objectives	Measures
2.1	Define "parliamentary procedure."	Refer to the VEG-AG-C/TIB 7063, pp. 13-14.
2.2	List five reasons for the use of parliamentary procedure.	
2.3	Correctly demonstrate the use of at least six parliamentary procedure abilities.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 3: The learner will prepare and present a five minute speech.

	Objectives	Measures
3.1	Prepare a speech related to agriculture or FFA.	Refer to the VEG-AG-C/TIB 7063, pp. 15-16.
3.2	Deliver a prepared speech in the classroom or in a public situation.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 4: The learner will make an inventory of assets and liabilities.

	Objectives	Measures
4.1	Define "assets" and "liabilities."	Refer to the VEG-AG-C/TIB 7063, pp. 17-18.
4.2	Determine the net worth of an individual.	
4.3	Define "inventory."	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 5: The learner will keep an up-to-date record book including expenses, receipts, work performed, and a financial statement.

Objectives	Measures
5.1 Prepare a financial statement.	Refer to the VEG-AG-C/TIB 7063, pp. 19-20.
5.2 Make entries of receipts and expenses in a farm record book.	
5.3 Analyze farm production records.	
5.4 Make production agriculture entries in a farm record book.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 6: The learner will describe agricultural resources.

Objectives		Measures
6.1	Define agricultural resources.	Refer to the VEG-AG-C/TIB 7063, p. 21.
6.2	Classify renewable and nonrenewable resources.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 7: The learner will identify the importance of agricultural resources as related to the national economy.

Objectives	Measures
7.1 Define the law of supply and demand.	Refer to the VEG-AG-C/TIB 7063, p. 22.
7.2 List agricultural resources that are important to the school community.	
7.3 Name jobs that are derived from agricultural resources.	

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AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 8: The learner will identify twenty-five occupations in the field of agricultural resources.

	Objectives	Measures
8.1	List and describe twenty-five occupations in the field of agricultural resources.	Refer to the VEG-AG-C/TIB 7063, pp. 23-24.
8.2	Classify a job as related to agricultural or nonagricultural resources.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 9: The learner will identify five career fields in the area of agricultural resources.

Objectives	Measures
9.1 List and describe five career fields in agricultural resources.	Refer to the VEG-AG-C/TIB 7063, p. 25.
9.2 Identify a career in agricultural resources.	
9.3 List the qualifications for five careers in agricultural resources.	

Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 10: The learner will identify at least ten basic skills needed to enter the agricultural resources job market.

	Objectives	Measures
10.1	Define ten basic skills needed to enter the agricultural resources job market.	Refer to the VEG-AG-C/TIB 7063, pp. 26-27.
10.2	Classify a skill as related to agricultural or nonagricultural resources.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 11: The learner will identify and explain eight benefits of forest resources.

Objectives		Measures
11.1	Name eight benefits of forest resources.	Refer to the VEG-AG-C/TIB 7063, p. 28.
11.2	Make a list of products which are a result of forest resources.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 12: The learner will identify taproot, lateral roots, root hair, trunk, outer bark, cambium, sapwood, heartwood, branches, crown, leaves, bud, twigs, flowers, fruit, and seed.

	Objectives	Measures
12.1	Define terms related to the main parts of a tree.	Refer to the VEG-AG-C/TIB 7063, p. 29.
12.2	Explain the function of each tree part.	
12.3	List all major parts of a tree.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 13: The learner will determine the species, age, and/or history of a standing tree using tree identification keys and an increment borer or hammer.

	Objectives	Measures
13.1	Define tools used in measuring a tree's age.	Refer to the VEG-AG-C/TIB 7063, p. 30.
13.2	Determine the rate of growth of a tree in a stand.	

Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 14: The learner will identify at least twenty trees common to the area.

	Objectives	Measures
14.1	Explain and demonstrate the proper way to use a tree identification key.	Refer to the VEG-AG-C/TIB 7063, p. 31.
14.2	Identify all common trees in the area.	
14.3	Prepare for the FFA Forestry Contest.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 15: The learner will identify at least four different government and professional forest management organizations and explain the services they provide.

	Objectives	Measures
15.1	Identify the different government and professional forest management organizations.	Refer to the VEG-AG-C/TIB 7063, p. 32.
15.2	Define what services each of these organizations provide.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 16: The learner will identify the functions of: fire rake, fire swatter, backpack pump, drip torch, ax and saw, and pulaski.

	Objectives	Measures
16.1	Explain the use of forest fire fighting tools.	Refer to the VEG-AG-C/TIB 7063, p. 33.
16.2	Identify and instruct which of the fire fighting tools should be used during a forest fire.	
16.3	Explain the safety procedures to follow when using fire fighting tools.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 17: The learner will describe: fire triangle, radiation, convection, conduction, and ignition temperature.

	Objectives	Measures
17.1	Define the fire triangle.	Refer to the VEG-AG-C/TIB 7063, p. 34.
17.2	Define convection, radiation, conduction, and ignition temperature.	

Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 18: The learner will compute the fire danger index.

Objectives		Measures
18.1	**Define the fire danger index.**	**Refer to the VEG-AG-C/TIB** 7063, p. 35.
18.2	Identify the factors which influence the fire danger index.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 19: The learner will locate on a topographic map, the position of a smoke to within one quarter mile using two azimuth readings and tower locations.

Objectives		Measures
19.1	**Locate a fire on a topographic map.**	Refer to the VEG-AG-C/TIB 7063, p. 36.
19.2	**Explain the proper use of a topographic map.**	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 20: The learner will identify five major tree diseases and describe their symptoms.

Objectives	Measures
20.1 Identify five major tree diseases and their causes.	Refer to the VEG-AG-C/TIB 7063, p. 37.
20.2 Know control methods and treatments for these tree diseases.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 21: The learner will identify eight major tree insects and describe the damage they do.

Objectives		Measures
21.1	Identify eight major tree insects.	Refer to the VEG-AG-C/TIB 7063, p. 38.
21.2	Know control methods and treatments for major tree insects.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 22: The learner will predict the volume of standing timber using one approved method. Determine the volume of felled trees either in cords or in board feet, and convert from cords to tonnage or weight.

	Objectives	Measures
22.1	Measure the volume board feet of standing and felled trees.	Refer to the VEG-AG-C/TIB 7063, pp. 39-40.
22.2	Measure the volume cords of standing and felled trees.	
22.3	Convert volume board feet or cord to tonnage or weight.	
22.4	Prepare students for FFA Forestry contest.	

VOCATIONAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 23: The learner will identify the private, state, and federal agencies in wildlife conservation and list their services.

	Objectives	Measures
23.1	Identify five private, state, or federal agencies in wildlife conservation.	Refer to the VEG-AG-C/TIB 7063, p. 41.
23.2	Identify the services provided by the private, state, or federal agencies in wildlife conservation.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 24: The learner will identify at least ten fish species common to North Carolina.

Objectives		Measures
24.1	Identify ten species of fish by their common names.	Refer to the VEG-AG-C/TIB 7663, pp. 42-43.
24.2	List the parts of a fish used for identification.	
24.3	Label the external parts of a fish.	
24.4	Differentiate among game fish and nongame fish species.	

Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 25: The learner will identify the major factors used to determine the need for adding fertilizer to fish ponds.

Objectives		Measures
25.1	Demonstrate the use of a testing stick to determine the need for adding fertilizer to a pond.	Refer to the VEG-AG-C/TIB 7663, pp. 44-45.
25.2	List three factors that determine the need for fertilizing a fish pond.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 26: The learner will fertilize ponds to obtain maximum growth of fish being produced using recommended fertilizers and rates.

	Objectives	Measures
26.1	Select correct fertilizer analysis for a specific pond.	Refer to the VEG-AG-C/TIB 7663, p. 45.
26.2	Apply the recommended rate of fertilizer.	
26.3	Describe two methods of applying fertilizers to ponds.	
26.4	Make a water color test.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 27: The learner will describe and map a workable plan for establishing a fish pond, considering the following factors: soil and topography, size and construction, water system, water supply, water quality, fish species, and carrying capacity.

	Objectives	Measures
27.1	Define the terms warm-water ponds and cool-water ponds.	Refer to the VEG-AG-C/TIB 7663, p. 46.
27.2	Recognize the environmental factors to be considered when establishing a fish pond.	
27.3	Select the appropriate fish species for a specific fish pond.	

Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 28: The learner will identify important bird and animal species and classify as game, nongame, nuisance, or endangered.

Objectives	Measures
28.1 Identify five game animals.	Refer to the VEG-AG-C/TIB 7663, pp. 46-47.
28.2 Distinguish between upland and migratory game birds.	
28.3 List five nongame birds and animals.	
28.4 Differentiate among extinct and endangered birds and animals.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 29: The learner will identify the six classes of nutrients and give a source and function for each nutrient class.

Objectives		Measures
29.1	Identify six classes of nutrients.	Refer to the VEG-AG-C/TIB 7663, p. 48.
29.2	Name one source for each nutrient class.	
29.3	Summarize the functions of the six nutrient classes.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 30: The learner will identify the five basic firearm actions.

	Objectives	Measures
30.1	Identify five firearm actions.	Refer to the VEG-AG-C/TIB 7663, p. 49.
30.2	Label the parts of a firearm.	
30.3	Demonstrate safe use of firearms.	
30.4	Explain the difference between a rifle and a shotgun.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 31: The learner will identify three methods of harvesting game species.

Objectives	Measures
31.1 List three methods of harvesting game.	Refer to the VEG-AG-C/TIB 7663, p. 50.
31.2 Demonstrate safety procedures be used with harvesting game equipment.	
31.3 Explain "season" and "bag limits."	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 32: The learner will identify the types of hunting ammunition.

	Objectives	Measures
32.1	Label parts of a shotgun shell and a rifle cartridge.	Refer to the VEG-AG-C/TIB 7663, pp. 32-33.
32.2	Select proper ammunition for species of game.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 33: The learner will identify the three types of hunting bows.

Objectives		Measures
33.1	Identify three types of hunting bows.	Refer to the VEG-AG-C/TIB 7663, pp. 53-54.
33.2	Replace safely a bow string on a recurve bow.	
33.3	Select a bow and demonstrate its safe use.	
33.4	Point out the difference between compound and recurve bows.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 34: The learner will identify five survival techniques necessary for safe participation in outdoor activities.

Objectives		Measures
34.1	List five survival techniques.	Refer to the VEG-AG-C/TIB 7663, pp. 55-56.
34.2	Sketch three survival signals.	
34.3	Demonstrate how to apply a tourniquet.	
34.4	Identify poisonous plants.	

VOCATIONAL EDUCATION
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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 35: The learner will identify the five major soil-forming factors.

	Objectives	Measures
35.1	Describe the processes necessary to form soil.	Refer to the VEG-AG-C/TIB 7663, pp. 57-58.
35.2	List rocks from which soil materials are formed.	
35.3	Name forces which transport soils.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 36: The learner will identify and analyze the major horizons and subhorizons of soil.

Objectives	Measures
36.1 Define "soil horizon."	Refer to the VEG-AG-C/TIB 7663, p. 59.
36.2 Describe the major soil horizons.	
36.3 Identify the soil horizons in a soil profile.	

VOCATIONAL EDUCATION
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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 37: The learner will identify the physical properties of soil.

	Objectives	Measures
37.1	List the physical properties of soil.	Refer to the VEG-AG-C/TIB 7663, p. 60.
37.2	Classify soils by using their physical properties.	
37.3	Describe the aeration and water movement of each soil type.	

VOCATIONAL EDUCATION
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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 38: The learner will identify the chemical properties of soil.

Objectives		Measures
38.1	Take soil samples.	Refer to the VEG-AG-C/TIB 7663, p. 61.
38.2	Read and follow recommendations of a soil test.	
38.3	List micro and macro nutrients needed by plants.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 39: The learner will identify the biological properties of soil.

	Objectives	Measures
39.1	Define "legume crop."	Refer to the VEG-AG-C/TIB 7663, p. 62.
39.2	Outline the important groups of organisms commonly found in soils.	
39.3	Take nematode samples.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 40: The learner will identify the eight major land classes and the requirements for classifying each one.

	Objectives	Measures
40.1	Define soil classification and land use terms.	Refer to the VEG-AG-C/TIB 7663, pp. 63-64.
40.2	Make a soil profile.	
40.3	Judge soil by using an official land judging scorecard.	

VOCATIONAL EDUCATION
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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 41: The learner will recommend appropriate conservation practices considering the land capability and optimum land use for a specific area.

Objectives	Measures
41.1 Identify the different soil conservation practices.	Refer to the VEG-AG-C/TIB 7663, pp. 65-66.
41.2 Draw up a plan for conservation practices on her/his property.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 42: The learner will recognize and identify the forms of erosion and state the probable causative agent in a specific erosion area.

Objectives		Measures
42.1	Define "soil erosion."	Refer to the VEG-AG-C/TIB 7663, pp. 67-68.
42.2	List natural resources.	
42.3	Describe the difference between geological and man-made erosion.	
42.4	Use a soil map to lay out a plan to control soil erosion.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 43: The learner will identify four appropriate erosion control cover crops or structures for a specific land situation.

Objectives		Measures
43.1	Match erosion control cover crops or structure with various land situations.	Refer to the VEG-AG-C/TIB 7663, p. 69.
43.2	Identify at least four cover crops used to control soil erosion.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 44: The learner will read an aerial photograph in order to determine distances, present land use, woodland, water, and land features needed for conservation planning.

	Objectives	Measures
44.1	Measure land area and distance on an aerial map with proper scale.	Refer to the VEG-AG-C/TIB 7663, p. 69.
44.2	Write a plan for controlling soil erosion on a particular farm using an aerial map.	
44.3	Identify features on an aerial photograph.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 45: The learner will identify methods of linear measurements.

	Objectives	Measures
45.1	Determine the number of her/his steps in a chain.	Refer to the VEG-AG-C/TIB 7663, p. 70.
45.2	Determine the number of square feet in an area and convert to acres.	
45.3	Follow a direction with a compass.	
45.4	Measure land area by using a chain tape.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 46: The learner will identify types of legal or conservation surveys.

Objectives	Measures
46.1 Follow plot boundaries on a logging operation.	Refer to the VEG-AG-C/TIB 7663, p. 71.
46.2 Obtain a map from Register of Deeds offices.	
46.3 Determine depreciation on survey equipment.	
46.4 Follow directions and read a conservation survey.	

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AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 47: The learner will identify the common types of levels or transits and their parts.

Objectives	Measures
47.1 Label each part of a transit and level.	Refer to the VEG-AG-C/TIB 7663, pp. 73-74.
47.2 Set up a transit and level to mark a boundary.	
47.3 Set up a transit and level to mark the slope of a piece of land.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 48: The learner will identify the types of surveying rods and their uses.

Objectives		Measures
48.1	Describe the different types of surveying rods.	Refer to the VEG-AG-C/TIB 7663, p. 74.
48.2	Operate a surveying rod.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Practices

COMPETENCY GOAL 49: The learner will read soil maps and interpret the terms and symbols used on maps.

Objectives		Measures
49.1	Locate her/his home and school on map.	Refer to the VEG-AG-C/TIB 7663, p. 75.
49.2	Describe the soil characteristics around her/his home and school.	
49.3	List the crops that would grow best around her/his home.	
49.4	Determine the elevation of the school.	
49.5	Compute the air distance between school and her/his home.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Practices

COMPETENCY GOAL 50: The learner will take soil samples representative of an area, correctly complete the soil data forms, and submit them for laboratory analysis.

Objectives		Measures
50.1	Take soil samples in grass sod and a plow layer.	Refer to the VEG-AG-C/TIB 7663, pp. 76-77.
50.2	Fill soil sample boxes to proper level.	
50.3	Fill out soil sample forms.	
50.4	Carton soil samples for mailing.	

Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 51: The learner will test soil for acidity and alkalinity with accuracy of + .5 pH and recommend proper soil additives to correct the pH level to meet plant needs using soil samples and a pH testing kit.

Objectives	Measures
51.1 Define soil terms.	Refer to the VEG-AG-C/TIB 7663, pp. 78-79.
51.2 Take soil samples.	
51.3 Test soil for proper pH level.	
51.4 Define "pH scale."	

VOCATIONAL EDUCATION
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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 52: The learner will interpret the test results and make recommendations for necessary applications of lime, fertilizer, and micronutrients.

Objectives	Measures
52.1 Interpret symbols on a soil test result form.	Refer to the VEG-AG-C/TIB 7663, pp. 79-80.
52.2 Convert square feet to acres.	
52.3 Convert ounces to pounds.	
52.4 Define chemical symbols.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 53: The learner will calculate the amounts of nitrogen, phosphate, and potash to blend in order to obtain a specified analysis in a dry bulk amount of fertilizer within ± 1% accuracy.

Objectives	Measures
53.1 Convert percents of fertilizer to pounds of macronutrients per bag and acre.	Refer to the VEG-AG-C/TIB 7663, p. 81.

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 54: The learner will apply required amounts of lime, fertilizer, and micronutrients which will meet the recommendations for a specified land area using crop and soil test data.

Objectives	Measures
54.1 Convert square feet to acres.	Refer to the VEG-AG-C/TIB 7663, pp. 82-83.
54.2 Define the type of soil requiring fertilizer and lime.	
54.3 List methods of distributing fertilizer.	
54.4 Figure cost of fertilizer and lime per acre.	
54.5 Calibrate equipment to apply precise the amount of fertilizer.	
54.6 Measure land area to be fertilized.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 55: The learner will identify two classes of water for home and industrial use.

Objectives		Measures
55.1	Identify two classes of water for home and industrial use.	Refer to the VEG-AG-C/TIB 7663, pp. 83-84.
55.2	List four sources of surface water.	
55.3	Recognize three forms of water	
55.4	Describe two methods of obtaining ground water.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 56: The learner will describe the effects of storage on water and identify six factors which control these effects.

Objectives	Measures
56.1 List two sources of water for collection and storage.	Refer to the VEG-AG-C/TIB 7663, p. 85.
56.2 Describe two major types of water storage tanks.	
56.3 Describe the protection which should be given a ground level water storage tank.	
56.4 Describe the protection which should be given a storage pond and watershed area.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 57: The learner will describe hygroscopic water, capillary water, and gravitational water.

Objectives		Measures
57.1	Explain the characteristics of hygroscopic water, capillary water, and gravitational water.	Refer to the VEG-AG-C/TIB 7663, p. 86.
57.2	Recognize ways to retain gravitational water.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 58: The learner will write a description of the hydrologic cycle process including precipitation evaporation, transpiration, and condensation.

	Objectives	Measures
58.1	Write and/or diagram the hydrologic cycle.	Refer to the VEG-AG-C/TIB 7663, pp. 87-88.
58.2	Demonstrate evaporation and condensation in a laboratory situation.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 59: The learner will check for symptoms of oxygen deficiency in fish pond water and prescribe a remedial program.

	Objectives	Measures
59.1	List the causes of oxygen deficiency in fish pond water.	Refer to the VEG-AG-C/TIB 7663, pp. 89-90.
59.2	Prepare treatment program for replacing oxygen in fish pond water.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 60: The learner will test oxygen content of a given pond to an accuracy of two parts per million.

	Objectives	Measures
60.1	**Analyze pond water samples to determine oxygen content within two parts per million accuracy.**	Refer to the VEG-AG-C/TIB 7663, p. 91.
60.2	Collect pond water samples.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 61: The learner will test pH of water in a specified pond to within ± 1 pH level of accuracy.

	Objectives	Measures
61.1	Test water samples to within ± 1 pH level of accuracy.	Refer to the VEG-AG-C/TIB 7663, p. 91.
61.2	Explain water test results.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 62: The learner will test water temperature of a lake or pond to an accuracy within ± 3°F.

Objectives		Measures
62.1	Demonstrate how to determine the water temperature of a given pond to within ± 3°F.	Refer to the VEG-AG-C/TIB 7663, p. 92.
62.2	Select proper thermometers for checking pond temperature.	

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AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 63: The learner will use clippers or fish tagging pliers to mark fish so that the mark will be recognizable upon their recapture.

	Objectives	Measures
63.1	Use clippers or tagging pliers to mark fish for later recognition after recapture.	Refer to the VEG-AG-C/TIB 7663, p. 92.
63.2	Interpret marks on fish.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 64: The learner will identify and recognize a species of gamebirds that would be profitable to propagate.

Objectives		Measures
64.1	Identify a game bird that would be profitable to propagate.	Refer to the VEG-AG-C/TIB 7663, pp. 93-94.
64.2	Recognize three game birds that will adjust to the field after propagation and release.	

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Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 65: The learner will develop a breeding, reproduction, and incubation program that will produce game birds with less than 10% loss given the species and desired number of birds to be propagated.

	Objectives	Measures
65.1	Outline a breeding, reproduction, and incubation program to produce game birds with less than 10% loss.	Refer to the VEG-AG-C/TIB 7663, p. 95.
65.2	Predict the desired number of game birds to be propagated.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 66: The learner will carry out a plan for brooding a designated species of game birds which will result in a minimum loss of birds.

Objectives	Measures
66.1 Describe a brooding plan for a designated species of game birds.	Refer to the VEG-AG-C/TIB 7663, p. 96.
66.2 Produce game birds of a designated species with minimum losses.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 67: The learner will develop a feeding system, a balanced ration, and use feeders which will minimize waste for a specific number of growing birds.

	Objectives	Measures
67.1	Plan a feeding system for a specific lot of growing birds.	Refer to the VEG-AG-C/TIB 7663, p. 97.
67.2	Develop a balanced ration for game birds.	
67.3	Select appropriate feeders for game birds.	

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Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 68: The learner will prescribe and implement a plan for preventing and/or curing common diseases and parasites which affect game birds to minimize losses during brooding and growth.

Objectives	Measures
68.1 Identify major diseases and parasites of game birds.	Refer to the VEG-AG-C/TIB 7663, pp. 98-99.
68.2 List major causes of game bird diseases.	

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Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 69: The learner will handle and transport game birds in a manner which will prevent injury and feather loss using special crates and catching nets.

	Objectives	Measures
69.1	Demonstrate proper handling of game birds.	Refer to the VEG-AG-C/TIB 7663, p. 100.
69.2	Select special crates for transporting game birds.	
69.3	Demonstrate use of catching nets for gamebirds.	

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Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 70: The learner will identify the common pests that affect wildlife.

Objectives	Measures
70.1 Identify the common diseases that affect wildlife.	Refer to the VEG-AG-C/TIB 7663, p. 101.
70.2 Identify parasites that affect wildlife.	

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AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 71: The learner will demonstrate the safe use of hunting equipment.

Objectives	Measures
71.1 Demonstrate the safe use of hunting equipment.	Refer to the VEG-AG-C/TIB 7663, p. 102.
71.2 Inspect hunting equipment for safe use.	

VOCATIONAL EDUCATION
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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 72: The learner will describe the following: air, radiation, conduction, convection, wind, and inversion.

	Objectives	Measures
72.1	Demonstrate an understanding of the natural processes in the atmosphere by defining and describing: air, radiation, conduction, convection, wind, and inversion.	Refer to the VEG-AG-C/TIB 7663, pp. 103-104.

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 73: The learner will identify five sources of air pollutants and describe their effects on the environment.

	Objectives	Measures
73.1	Identify five sources of air pollutants.	Refer to the VEG-AG-C/TIB 7663, p. 105.
73.2	Describe the effects of air pollutants on the environment.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 74: The learner will describe the physical, chemical, and radioactive properties of six air pollutants.

Objectives	Measures
74.1 Describe the physical, chemical, and radioactive properties of six air pollutants.	Refer to the VEG-AG-C/TIB 7663, p. 106.

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 75: The learner will identify and describe four types of air pollution control equipment.

Objectives	Measures
75.1 List and describe four types of air pollution control equipment.	Refer to the VEG-AG-C/TIB 7663, pp. 107-108.

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 76: The learner will describe three natural ways to control air pollution.

Objectives	Measures
76.1 Describe three natural ways to control air pollution.	Refer to the VEG-AG-C/TIB 7663, p. 109.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 77: The learner will explain the potential effects of specific gases and particulates on human health, plant life, and the durability of materials.

Objectives		Measures
77.1	Explain effects of harmful gases and particulates on human health, plant life, and materials.	Refer to the VEG-AG-C/TIB 7663, p. 110.
77.2	Identify harmful gases and particulates.	

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Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 78: The learner will identify three reasons for sampling air.

Objectives		Measures
78.1	State three reasons for sampling air.	Refer to the VEG-AG-C/TIB 7663, pp. 111-112.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 79: The learner will identify and describe two types of static samplers used for testing.

Objectives	Measures
79.1 Identify two types of static samplers.	**Refer to the VEG-AG-C/TIB 7663, p. 113.**
79.2 Describe the proper use of two static samplers.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 80: The learner will identify the available surface water and ground water supplies including waterways, water impoundments, and aquifers in a specified land area.

	Objectives	Measures
80.1	**Name the available sources of surface and ground water in a specific area.**	Refer to the VEG-AG-C/TIB 7663, p. 114.
80.2	**Locate on an aerial photograph and/or topographic map the sources of surface water.**	
80.3	**Identify at least one area on a topographic map that would serve as an area for water impoundment.**	
80.4	**Define a watershed.**	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 81: **The learner will identify present and potential sources and types of water pollution in a given area.**

	Objectives	Measures
81.1	**Recognize visible sources of pollution on a watershed.**	**Refer to the VEG-AG-C/TIB 7663, pp. 115-116.**
81.2	**Prescribe measures for removal of pollution sources from a specified watershed.**	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 82: The learner will recognize visible sources of pollution on a watershed and prescribe measures of eradication.

	Objectives	Measures
82.1	Identify sources of water pollution in a given area.	Refer to the VEG-AG-C/TIB 7663, pp. 117-118.

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 83: The learner will identify five different methods of treating wastewater and describe each.

	Objectives	Measures
83.1	Identify five methods of treating wastewater.	Refer to the VEG-AG-C/TIB 7663, p. 119.

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 84: The learner will recognize visible indications of pollution in lakes and streams, and describe probable causes.

	Objectives	Measures
84.1	Recognize, by visual means, indicators of pollution in lakes and streams.	Refer to the VEG-AG-C/TIB 7663, p. 120.
84.2	Describe the probable cause of pollution symptoms in lakes and streams.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 85: The learner will identify five kinds of industrial waste and briefly describe how each pollutes the waters.

	Objectives	Measures
85.1	Identify five kinds of industrial wastes that pollute water.	Refer to the VEG-AG-C/TIB 7663, p. 121.
85.2	Describe ways that industrial wastes pollute lakes and streams.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 86: The learner will diagram a sewage disposal system for a given farm.

	Objectives	Measures
86.1	**Diagram a sewage disposal system for a specified farm.**	**Refer to the VEG-AG-C/TIB 7663, pp. 122-123.**
86.2	**Describe the function of a farm sewage disposal system.**	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 87: The learner will identify the parts of an irrigation system.

	Objectives	Measures
87.1	Identify the parts of an irrigation system.	Refer to the VEG-AG-C/TIB 7663, pp. 123-124.

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 88: The learner will identify major factors to be considered before establishing a water management system for a specific land area needing irrigation for maximum crop production.

	Objectives	Measures
88.1	**Identify the factors to consider in planning and establishing a water management system for crop irrigation to achieve maximum production.**	**Refer to the VEG-AG-C/TIB 7663, p. 125.**

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 89: The learner will prescribe when, how much, and how often to irrigate a specific crop in order to achieve a specified soil moisture level.

	Objectives	Measures
89.1	Prescribe how much and how often to irrigate to maintain a specified moisture level in the soil.	Refer to the VEG-AG-C/TIB 7663, p. 126.

Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 90: The learner will prepare a written report prescribing insect and disease control measures for a given site and forest conditions.

Objectives		Measures
90.1	**Identify insects and diseases found in a given site and develop a plan of control and treatment for the area.**	Refer to the VEG-AG-C/TIB 7663, p. 126.
90.2	Incorporate into the report, safety techniques in handling and applying the chemicals.	
90.3	Prepare and present a report on insect and disease control measures for a given forest site and condition.	

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AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 91: The learner will prescribe pesticides, considering chemicals to be used, mixing proportions, quantity of elements, timing and methods of safe application.

Objectives		Measures
91.1	Select the proper chemical for a specific situation.	Refer to the VEG-AG-C/TIB 7663, pp. 127-128.
91.2	Mix and apply correctly the proper chemicals for a specific situation.	
91.3	Describe the chemical used, procedure used, and method of application for a specific situation.	

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AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 92: The learner will develop a reforestation plan, specifying method used, seedbed preparation, tree species, and spacing between trees.

	Objectives	Measures
92.1	Develop a plan for reforestation.	Refer to the VEG-AG-C/TIB 7663, pp. 129-130.
92.2	Know how to prepare the seedbed.	
92.3	Select the proper species of tree for a specific situation.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 93: The learner will identify and implement different methods of cruising timber.

Objectives		Measures
93.1	Identify the different methods of cruising timber.	Refer to the VEG-AG-C/TIB 7663, p. 131.
93.2	Demonstrate the ability to use each method of cruising timber.	
93.3	Accurately cruise a specified timber stand.	

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Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 94: The learner will develop a complete written management plan for a designated stream, lake, or pond, considering the following management factors: oxygen supply, controlling undesirable fish, snakes, and frogs; controlling weeds, diseases, and parasites; fishing pressure; feasibility and timing of stocking.

	Objectives	Measures
94.1	**List the management factors necessary for a designated body of water.**	Refer to the VEG-AG-C/TIB 7663, p. 132.
94.2	**Prepare a written management plan for a specific pond.**	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 95: The learner will stock, manage, and handle brood fish in order to maximize the production of young.

	Objectives	Measures
95.1	Stock a fish pond.	Refer to the VEG-AG-C/TIB 7663, p. 133.
95.2	Select and identify brood fish.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 96: The learner will manage and handle eggs and fry, using appropriate hatchery techniques to maximize survival rates.

Objectives		Measures
96.1	Demonstrate procedure for handling fish eggs.	Refer to the VEG-AG-C/TIB 7663, p. 134.
96.2	Use appropriate hatchery techniques for managing fry in order to maximize survival rate.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 97: The learner will use trucks with necessary oxygen and cooling equipment to transport and stock fish in water impoundments so that there will be a less than 10% fish mortality rate.

	Objectives	Measures
97.1	Demonstrate the transport of fish with appropriate equipment.	Refer to the VEG-AG-C/TIB 7663, p. 134.
97.2	Select transport equipment necessary for stocking fish ponds.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 98: The learner will use appropriate publications to plan a workable hunting preserve design, considering the following factors: species of wildlife, food crops, cover crops, breeding and nesting areas, water management, predator control, regulation of hunting, and wildlife sanctuaries.

	Objectives	Measures
98.1	List the management factors of a hunting preserve.	Refer to the VEG-AG-C/TIB 7663, p. 135.
98.2	Outline the procedure for developing a hunting preserve.	

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Grade Level: 10-12   Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 99: The learner will choose an appropriate census method in order to make an accurate determination of a specific wild life species population.

	Objectives	Measures
99.1	Appraise the cover and food supply of a designated area.	Refer to the VEG-AG-C/TIB 7663, p. 136.
99.2	Compute the wildlife population that an area could support.	

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Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 100: The learner will evaluate the cover density and available wildlife food in a designated area with accuracy, in order to determine potential wildlife populations.

Objectives	Measures
100.1 List the census methods for counting wildlife populations.	Refer to the VEG-AG-C/TIB 7663, p. 137.
100.2 Select and use a census method to determine the population of a specific wildlife species.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 101: The learner will identify and describe the function of dustfall buckets, lead dioxide candles, and high volume filter samplers.

	Objectives	Measures
101.1	**Recognize and describe the function of dustfall buckets, lead dioxide candles, and high volume filter samplers.**	Refer to the VEG-AG-C/TIB 7663, pp. 138-139.

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AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 102: The learner will perform the sampling of air using dustfall buckets, lead dioxide candles, and high volume samplers.

Objectives	Measures
102.1 Perform the sampling of air using dustfall buckets, lead dioxide candles, and high volume filter samplers.	Refer to the VEG-AG-C/TIB 7663, p. 140.
102.2 Perform the procedure of making an air pollution sample.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 103: The learner will describe and perform procedures in selecting air sampling sites.

Objectives	Measures
103.1 Select the proper air sampling site.	Refer to the VEG-AG-C/TIB 7663, p. 140.

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 104: The learner will identify three air testing samplers, and will choose one to analyze ambient particulates.

Objectives	Measures
104.1 **Identify three air test samplers and perform a sampling and analysis of ambient particulates.**	Refer to the VEG-AG-C/TIB 7663, p. 141.

Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 105: The learner will conduct the sampling and analysis of water for microorganisms, hardness, ph, and chemicals such as nitrogen, phosphorous, iron, and sulfur, using appropriate equipment, supplies, and following manufacturers' recommendations.

Objectives		Measures
105.1	Follow procedures outlined by teacher in collecting water samples for analysis.	Refer to the VEG-AG-C/TIB 7663, p. 142.
105.2	Follow the manufacturer's directions in using the supplies and equipment in a water analysis kit to determine the level of a specified chemical to an accuracy of ± ppm.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 106: The learner will estimate the annual, monthly, and daily demand for water when given a specified community size and location.

	Objectives	Measures
106.1	Estimate daily, monthly, and annual demand for water for a family when given a specified community and location.	Refer to the VEG-AG-C/TIB 7663, p. 143.
106.2	Identify the three major uses of water in an area.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 107: The learner will recognize and identify the different types of natural resources used for recreational areas and the kinds of services required for each type.

Objectives	Measures
107.1 Identify three natural resources used for recreational areas.	Refer to the VEG-AG-C/TIB 7063, pp. 144-145.
107.2 List one service required for each of the three natural resources used for recreational areas.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 108: The learner will inventory specified outdoor recreation enterprises in order to develop a list of additional outdoor enterprises that are feasible considering location, needed facilities, and vegetation.

Objectives	Measures
108.1 List on an inventory all the recreational enterprises in a specified area.	Refer to the VEG-AG-C/TIB 7063, p. 146.
108.2 Identify three additional recreational enterprises which would be feasible for a specified area.	
108.3 List facilities needed for a specified recreational enterprise.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 109: The learner will recognize the three most suitable outdoor recreation enterprises for a designated area, considering the alternative enterprises, location, community, and management necessary.

	Objectives	Measures
109.1	Select the one recreational enterprise that would be best for a specified area considering location, community size, and physical site.	Refer to the VEG-AG-C/TIB 7063, p. 147.

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 110: The learner will analyze a designated site to determine the alternative outdoor recreation enterprises that could be established there.

Objectives	Measures
110.1 Analyze a specified site to determine the recreational enterprises which could be established there.	Refer to the VEG-AG-C/TIB 7063, p. 147.
110.2 Recognize five hazards to natural resources created by recreation enterprises.	

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Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 111: The learner will prepare a short-term development plan which includes facility construction and initial management needs for a specific site and enterprise.

Objectives	Measures
111.1 Identify initial construction needs for a specific site and enterprise.	Refer to the VEG-AG-C/TIB 7063, p. 148.
111.2 Identify management needs for the same specific site and enterprise.	
111.3 Calculate the potential income from an enterprise.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 112: The learner will prepare a long-range development plan (5-10 years) for a selected enterprise considering initial and additional development and management requirements.

Objectives	Measures
112.1 Identify initial construction and management requirements.	Refer to the VEG-AG-C/TIB 7063, p. 148.
112.2 Identify additional developments for the future.	
112.3 Determine investment, fixed, and operating costs.	
112.4 Identify gross and net return.	
112.5 Identify management requirements for the future.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 113: The learner will prepare a budget using basic bookkeeping procedures for a designated enterprise which would include fixed costs, variable costs, gross returns, and labor and management income, using cost and return data from similar enterprises.

Objectives	Measures
113.1 Determine investment and fixed costs.	Refer to the VEG-AG-C/TIB 7063, p. 149.
113.2 Determine operating costs.	
113.3 Identify gross and net returns.	
113.4 Calculate labor and management.	
113.5 Determine depreciation of enterprises.	

Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 114: The learner will identify the sources of financial and technical assistance for outdoor recreation enterprises on local, state, and federal levels.

Objectives	Measures
114.1 List four sources of financial assistance for outdoor recreation enterprises.	Refer to the VEG-AG-C/TIB 7063, p. 150.
114.2 Identify four agencies which provide technical assistance for outdoor recreation enterprises.	

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Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 115: The learner will identify laws pertaining to a designated outdoor recreation enterprise using federal, state, and local codes and regulations.

Objectives	Measures
115.1 Identify four legal restrictions on outdoor recreation enterprises.	Refer to the VEG-AG-C/TIB 7063, p. 151.
115.2 List three fire regulations for an outdoor recreation enterprise.	

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Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 116: The learner will identify the insurance program needed to prevent losses in case of accidents for a specified outdoor recreation enterprise.

Objectives		Measures
116.1	Identify five kinds of insurance needed for recreation enterprises.	Refer to the VEG-AG-C/TIB 7063, pp. 152-153.
116.2	Point out the difference between liability and accident insurance.	

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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 117: The learner will develop a comprehensive safety program which will provide safe conditions for employees and clientele for a specified type of outdoor recreation enterprise.

	Objectives	Measures
117.1	Outline a safety program for a recreational area.	Refer to the VEG-AG-C/TIB 7063, p. 154.
117.2	Describe a safety program for a specified recreational area.	

Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 118: The learner will develop a complete public relations program for a given outdoor recreation enterprise including the development of a promotional brochure.

Objectives		Measures
118.1	Develop a newspaper or magazine advertisement for an outdoor recreation enterprise.	Refer to the VEG-AG-C/TIB 7063, p. 155.
118.2	Write announcements for radio and TV spots.	
118.3	Develop a public relations brochure for an outdoor recreation enterprise.	
118.4	Design a plan for billboard advertisement.	
118.5	Develop quality penmanship.	

VOCATIONAL EDUCATION
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Grade Level: 10-12

Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 119: The learner will use appropriate printed materials to develop a workable recreational facility site design, considering: carrying capacity of the site, types of facilities; design of all roads, buildings, campsites, water, sewage facilities, trails, platforms, fireplaces, rubbish disposal facilities, benches, stables, safety regulation devices, signs and lighting; and design of all cultural treatment of vegetation including landscaping, removal of hazardous vegetation, scenic vistas, barriers, lawns, and erosion control.

Objectives	Measures
119.1 Outline the facility specifications when assigned a specific area to be developed as a campground and/or other recreational facility.	Refer to the VEG-AG-C/TIB 7063, p. 156.
119.2 Design to scale the facilities for a campground and/or other recreational facility when given a site and a specification sheet of facilities needed.	

Grade Level: 10-12 Skills/Subject Area: Natural Resources and Environmental Protection

COMPETENCY GOAL 120: The learner will develop a workable plan for the maintenance of a developed recreation area including: upkeep of facilities, provision of services, maintenance of roads and trails, and maintenance of vegetation.

Objectives	Measures
120.1 Outline a plan for recreation area maintenance.	Refer to the VEG-AG-C/TIB 7063, p. 156
120.2 Select equipment for a specified maintenance job.	
120.3 Service equipment used for maintenance.	

Ornamental Horticulture I Outline

1. Leadership/FFA

    a. Parliamentary procedure
    b. Public speaking
    c. Supervised occupational experience

2. Introduction to Horticultural Science

3. Small Engines

    a. Small engine fundamentals
    b. Small engine tune-up
    c. Small engine maintenance

4. Customer Relationships

5. Occupational Opportunities in Ornamental Horticulture

    a. Occupations and career fields
    b. Basic skills needed to enter these fields

6. Plant Growth and Development

    a. Parts of plants and functions of these parts
    b. Processes of growth in horticultural plants

7. Pruning Ornamental Plants

    a. Pruning tools and supplies
    b. Methods of pruning

8. Planting or Transplanting Ornamental Plants

    a. Container-grown plants
    b. Bareroot plants
    c. Balled and burlapped plants

9. Greenhouse Management

    a. Structures for growing plants
    b. Management and use for greenhouse equipment

10. Horticultural Soils

    a. Soil characteristics
    b. Soilless culture

11. Horticultural Chemicals
    - a. Plant nutrients
    - b. Pesticides

12. Plant Propagation
    - a. Sexual propagation
    - b. Asexual propagation

Ornamental Horticulture II Outline

1. Plant Identification
    - a. Identifying ornamental plants
    - b. Selection of plants for the landscape

2. Fertility and Fertilizing
    - a. Fertilizer types
    - b. Fertilizer deficiencies
    - c. Fertilizer application
    - d. Soil test report

3. Pest Control
    - a. Pest identification
    - b. Chemical pest control

4. Special Purpose Pruning
    - a. Pruning evergreen and deciduous shrubs
    - b. Root pruning
    - c. Pruning and training for special purposes

5. Flowering Crops in the Greenhouse

6. Floral Design
    - a. The art of floral design
    - b. Landscaping design
    - c. Spacing materials and equipment
    - d. Landscape installation and maintenance

7. Nursery Propagation
    - a. Cuttings
    - b. Grafting and budding

8. Growing Nursery Stack
    a. Facilities for nursery stock
    b. Transplanting and slathouse care

9. Digging and Planting Trees and Shrubs

Ornamental Horticulture III Outline

1. Floral Crop Scheduling
    a. Schedule of activities
    b. Flowering crop culture

2. Nursery Seed Germination

3. Turf Identification
    a. Identification of turfgrass varieties
    b. Selection of proper turf for a given area

4. Turf Site Preparation
    a. Subsurface drainage
    b. Surface grading
    c. Preparing turf seed bed

5. Turf Establishment
    a. Seeding
    b. Sodding
    c. Stolons

6. Turf Maintenance
    a. Mowing equipment and procedures
    b. Identifying and controlling turf pests
    c. Turf fertilization
    d. Turf watering

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 1: The learner will preside over any business session not just FFA business and committee meetings.

	Objectives	Measures
1.1	Possess a current knowledge of FFA so that organizational structure can be carried out effectively.	Refer to the VEG-AG-C/TIB 7053, pp. 11-12.
1.2	Be familiar with the different committees in FFA.	
1.3	Have a working knowledge of duties and responsibilities of individual officers.	
1.4	Demonstrate the ability to preside over FFA chapter and committee meetings.	

VOCATIONAL EDUCATION
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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 2: The learner will perform correctly fourteen rules of parliamentary procedure.

Objectives		Measures
2.1	Define "parliamentary procedure."	Refer to the VEG-AG-C/TIB 7053, pp. 13-14.
2.2	List five reasons for the use of parliamentary procedure.	
2.3	Demonstrate correctly the use of at least six rules of parliamentary procedure abilities.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 3: The learner will prepare and present a five minute speech.

Objectives	Measures
3.1 Prepare a speech related to agriculture or FFA.	Refer to the VEG-AG-C/TIB 7053, pp. 15-16.
3.2 Deliver a prepared speech in the classroom or in a public situation.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 4: The learner will make an inventory of assets and liabilities.

	Objectives	Measures
4.1	Define "assets" and "liabilities."	Refer to the VEG-AG-C/TIB 7053, pp. 17-18.
4.2	Determine the net worth of an individual.	
4.3	Define "inventory."	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 5: The learner will keep an up-to-date record book including expenses, receipts, work performed, and a financial statement.

Objectives	Measures
5.1 Prepare a financial statement.	Refer to the VEG-AG-C/TIB 7053, pp. 19-20.
5.2 Make entries of receipts and expenses in a record book.	
5.3 Analyze production records.	
5.4 Make production agriculture entries in a farm record book.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 6: The learner will describe ornamental horticulture.

Objectives		Measures
6.1	Identify the broad field of horticulture.	Refer to the VEG-AG-C/TIB 7053, p. 20.
6.2	Differentiate among the divisions of horticulture.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 7: The learner will state the importance of ornamental horticulture in relation to the national economy.

Objectives	Measures
7.1 Identify three reasons why ornamental horticulture is important to our national economy.	Refer to the VEG-AG-C/TIB 7053, p. 21.

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Grade Level: 10-12　　Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 8: The learner will identify seven occupations in the field of ornamental horticulture.

	Objectives	Measures
8.1	Identify job opportunities in the field of horticulture.	Refer to the VEG-AG-C/TIB 7053, pp. 22-23.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 9: The learner will identify five job or career fields in the area of ornamental horticulture.

	Objectives	Measures
9.1	Identify career fields in the area of ornamental horticulture.	Refer to the VEG-AG-C/TIB 7053, p. 24.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 10: The learner will identify basic skills needed to enter the labor market in ornamental horticulture.

Objectives		Measures
10.1	Identify skills needed in horticultural careers.	Refer to the VEG-AG-C/TIB 7053, p. 24.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 11: The learner will handle the objections and complaints of a customer while working in an ornamental horticulture business.

	Objectives	Measures
11.1	Describe the relationship between the customer and profit motive.	Refer to the VEG-AG-C/TIB 7053, pp. 25-26.
11.2	Describe the image an employee should portray to a customer.	
11.3	Role play a situation in which a customer complaint is handled.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 12: The learner will advertise and display items for sale in an ornamental horticulture business.

	Objectives	Measures
12.1	Describe the purpose of advertising.	Refer to the VEG-AG-C/TIB 7053, pp. 27-28
12.2	Describe the various advertising media.	
12.3	Lay out a typical customer "flow" pattern for a selected horticultural business.	
12.4	Prepare typical product displays that will relate to customer "flow" patterns.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 13: The learner will define the following terms related to small gasoline engines: 2 stroke-cycle, 4 stroke-cycle, cycle, stroke, rich mixture, lean mixture, troubleshooting, venturi, RPM, blow-by, horsepower, preventive maintenance, operator's manual, and overhaul.

	Objectives	Measures
13.1	Define the following terms: small engine, two-stroke cycle, four-stroke cycle, fuel mixture, venturi, blow-by, RPM, CID, horsepower, troubleshooting, preventive maintenance, operator's manual, and overhaul.	Refer to the VEG-AG-C/TIB 7053, pp. 29-30.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 14: The learner will describe the major support systems in an internal combustion engine: cooling, electrical, lubrication, fuel, intake, and exhaust.

	Objectives	Measures
14.1	Describe the function of the cooling, electrical, lubrication, fuel intake, starting, and exhaust systems.	Refer to the VEG-AG-C/TIB 7053, pp. 31-32.
14.2	Compare and contrast starting systems.	
14.3	Compare and contrast ignition systems.	
14.4	Compare and contrast carburetor systems.	
14.5	Compare and contrast types of air cleaners.	
14.6	Compare and contrast types of lubrication systems.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 15: The learner will recognize tools for diagnosis and repair of small gasoline engines.

Objectives	Measures
15.1 Identify hand tools used in repairing small engines.	Refer to the VEG-AG-C/TIB 7053, pp. 33-34.
15.2 Identify testing equipment used in troubleshooting problems in small engines.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 16: The learner will tune a small gasoline engine.

Objectives	Measures
16.1 List the procedures for tuning a small gasoline engine.	Refer to the VEG-AG-C/TIB 7053, pp. 33-34.
16.2 Indicate those parts of an engine that should be serviced or replaced using the appropriate tester or gauge.	
16.3 Tune a small engine as prescribed by the service manual.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 17: The learner will change oil and oil filters and service all engine points needing lubrication.

	Objectives	Measures
17.1	Identify the points on a small engine that require lubrication.	Refer to the VEG-AG-C/TIB 7053, p. 35.
17.2	Drain oil and refill crankcase to the proper level using the correct oil as prescribed by the operator's manual.	
17.3	Change oil filters.	
17.4	Select correct lubricating material and lubricate all service points.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 18: The learner will service all types of engine air cleaners using the appropriate procedures.

Objectives	Measures
18.1 **Service oil bath, oil filters, and air cleaners using proper cleaners and cleaning technique.**	Refer to the VEG-AG-C/TIB 7053, p. 37.
18.2 Determine when a dry filter needs replacement.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 19: The learner will adjust the carburetor properly.

Objectives	Measures
19.1 Identify the adjustments found on the three basic carburetor designs.	Refer to the VEG-AG-C/TIB 7053, p. 38.
19.2 Adjust the idle speed, idle mixture, and load mixture on a gravity feed carburetor.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 20: The learner will inspect the cooling system on a small gasoline engine.

Objectives	Measures
20.1 Discuss the advantages of a clean engine.	Refer to the VEG-AG-C/TIB 7053, pp. 39-40.
20.2 Demonstrate proper maintenance of the cooling system.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 21: The learner will identify principles of plant science as related to ornamental horticulture.

	Objectives	Measures
21.1	Differentiate between horticulture and other plant sciences.	Refer to the VEG-AG-C/TIB 7053, pp. 41-42.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 22: The learner will identify the principal parts of horticultural plants.

Objectives	Measures
22.1 Identify the basic parts of horticultural plants.	Refer to the VEG-AG-C/TIB 7053, pp. 43-44

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 23: The learner will identify and explain the functions of the principal parts of horticultural plants.

	Objectives	Measures
23.1	Identify and differentiate among the functions of the various parts of plants.	Refer to the VEG-AG-C/TIB 7053, pp. 45.

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 24: The learner will analyze the processes of growth in horticultural plants.

Objectives	Measures
24.1 Compare and contrast the processes of growth in horticultural plants.	Refer to the VEG-AG-C/TIB 7053, pp. 46.
24.2 Compare and contrast the stages of growth in horticultural plants.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 25: The learner will prune different kinds of ornamental plants properly.

Objectives		Measures
25.1	Compare and contrast the principles of different types of pruning.	Refer to the VEG-AG-C/TIB 7053, pp. 47-48.
25.2	Identify pruning tools and supplies.	
25.3	Compare and contrast the effects of pruning on various plants.	
25.4	Identify which season is appropriate for pruning various plants.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 26: The learner will plant or transplant selected ornamental plants.

Objectives		Measures
26.1	Identify and plant a container-grown plant.	Refer to the VEG-AG-C/TIB 7053, p. 48.
26.2	Identify and plant a bareroot plant.	
26.3	Identify and plant a B&B plant.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 27: The learner will apply herbicide using safe and proper procedure.

Objectives	Measures
27.1 Identify three nonselective herbicides.	Refer to the VEG-AG-C/TIB 7053, p. 49.
27.2 Identify three selective herbicides.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 28: The learner will describe selected functions of a greenhouse.

Objectives		Measures
28.1	List several functions of the greenhouse.	Refer to the VEG-AG-C/TIB 7053, p. 50.
28.2	Regulate the greenhouse environment through the use of heat, air, light, and moisture control to successfully grow various greenhouse crops.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 29: The learner will identify greenhouse management maintenance equipment.

	Objectives	Measures
29.1	List the major maintenance items and be able to perform such maintenance.	Refer to the VEG-AG-C/TIB 7053, p. 51.
29.2	Draw up plans for a greenhouse to meet the requirements of a specific crop.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 30: The learner will identify and describe soils and fertilizers used for horticultural plants.

Objectives	Measures
30.1 Identify and differentiate among horticultural soils.	Refer to the VEG-AG-C/TIB 7053, p. 52.
30.2 Define fertilizer terms.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 31: The learner will identify and demonstrate proper use of fertilizers and chemicals.

Objectives		Measures
31.1	Identify and demonstrate the use of nonrestricted horticultural chemicals.	Refer to the VEG-AG-C/TIB 7053, p. 53.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 32: The learner will identify and describe the use of various soil mixes.

Objectives		Measures
32.1	Identify what the most appropriate soil for various horticultural uses.	Refer to the VEG-AG-C/TIB 7053, p. 54.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 33: The learner will recognize ingredients for rooting, potting, and fine seeded media when given a choice of materials.

Objectives		Measures
33.1	Identify the characteristics of media for rooting, potting, and planting seed.	Refer to the VEG-AG-C/TIB 7053, p. 55.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 34: The learner will identify and describe different methods of plant propagation.

Objectives	Measures
34.1 Identify different methods of plant propagation.	Refer to the VEG-AG-C/TIB 7053, p. 56-57.
34.2 Compare and contrast different methods of plant propagation.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 35: The learner will sterilize soil by using heat or steam.

Objectives		Measures
35.1	Explain the various procedures for sterilizing soil.	Refer to the VEG-AG-C/TIB 7053, p. 58.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 36: The learner will apply both granular and liquid fertilizers safely and properly.

	Objectives	Measures
36.1	State at least three ways fertilizers improve crop production.	Refer to the VEG-AG-C/TIB 7053, p. 59.

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 37: The learner will identify selected bedding plants according to growth habit and use.

	Objectives	Measures
37.1	Identify at least ten bedding plants according to growth habit and use.	Refer to the VEG-AG-C/TIB 7053, p. 60.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 38: The learner will describe several problems in connection with growing bedding plants.

Objectives	Measures
38.1 List and solve three problems connected with growing bedding plants.	Refer to the VEG-AG-C/TIB 7053, p. 61.
38.2 List, and put into use principles involved in growing bedding plants.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 39: The learner will make and root twenty-five cuttings by mist propagation.

Objectives	Measures
39.1 Make and root twenty-five cuttings from herbaceous stem plants.	Refer to the VEG-AG-C/TIB 7053, p. 61.
39.2 Solve problems which may arise in plant propagation.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 40: The learner will seed bedding plants in hot bed or seed flat.

Objectives	Measures
40.1 Construct and use bedding plant structures.	Refer to the VEG-AG-C/TIB 7053, p. 62.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 41: The learner will prepare media and transplant bedding plants to pots.

Objectives	Measures
41.1 Mix and use special plant media.	Refer to the VEG-AG-C/TIB 7063, p. 62.

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 42: The learner will identify the proper size plants where limited space considerations are indicated in a tree and shrub list or set of landscaping plans.

Objectives		Measures
42.1	Identify plants by color, foliage, leaf arrangement, berries, fruit, and growth habit.	Refer to the VEG-AG-C/TIB 7053, pp. 63-64.
42.2	Identify plants according to function in the landscape plan.	
42.3	Select and use appropriate plants according to an organized plan.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 43: The learner will dig, bag, and burlap (B&B) shrubs.

	Objectives	Measures
43.1	Demonstrate the procedure for digging a field grown plant.	Refer to the VEG-AG-C/TIB 7053, p. 65.
43.2	Demonstrate the procedure for burlapping a field grown plant.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 44: The learner will plant or transplant selected ornamental plants which are bare root, balled, and burlapped.

	Objectives	Measures
44.1	Demonstrate the procedure for planting bare root plants.	Refer to the VEG-AG-C/TIB 7053, p. 66.
44.2	Demonstrate the procedure for planting container-grown plants.	
44.3	Demonstrate the procedure for planting burlapped plants.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 45: The learner will determine the amount of actual plant food in several fixed analysis fertilizers to an accuracy within one pound.

	Objectives	Measures
45.1	Compare and contrast the different types of fertilizer.	Refer to the VEG-AG-C/TIB 7053, pp. 67-68.
45.2	Differentiate between macro and micronutrients.	
45.3	Compute pounds of actual plant food in a bag of fertilizer.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 46: The learner will determine the fertility needs of trees exhibiting undersized or yellow leaves, sparse foliage, or little twig or branch growth.

	Objectives	Measures
46.1	Recognize macronutrient plant deficiencies.	Refer to the VEG-AG-C/TIB 7053, pp. 69-70.
46.2	Recognize the difference between a chemical deficiency and an environmental deficiency.	
46.3	Choose an appropriate method of applying fertilizer according to specific plant requirements.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 47: The learner will know how to restore a tree or shrub to good health through repairing or removing a given injury.

	Objectives	Measures
47.1	Prune an evergreen shrub to the satisfaction of the teacher.	Refer to the VEG-AG-C/TIB 7053, p. 71.
47.2	Prune a deciduous shrub to the satisfaction of the teacher.	
47.3	Perform corrective pruning on a damaged tree or shrub.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 48: The learner will perform corrective pruning procedures in order to develop a more balanced, compact appearance in a specified odd-shaped shrub.

Objectives		Measures
48.1	Perform corrective pruning on an odd-shaped plant.	Refer to the VEG-AG-C/TIB 7053, p. 71.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 49: The learner will shear a formal hedge in order to maintain a trick, compact growth in a specified conformation.

Objectives	Measures
49.1 Shear a formal hedge plant to the satisfaction of the teacher.	Refer to the VEG-AG-C/TIB 7053, p. 72.

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 50: The learner will identify flower crops by their growing habits and uses.

	Objectives	Measures
50.1	Identify and use marketable flowering crops.	Refer to the VEG-AG-C/TIB 7053, p. 73.

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 51: The learner will sterilize soil with methyl bromide or other chemicals.

	Objectives	Measures
51.1	**Demonstrate procedures for sterilizing soil.**	**Refer to the VEG-AG-C/TIB 7053, p. 74.**

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 52: The learner will regulate greenhouse equipment in order to control temperature, light, and moisture.

	Objectives	Measures
52.1	Recognize temperature regulation as a factor in growing greenhouse plants.	Refer to the VEG-AG-C/TIB 7053, p. 75.
52.2	Control quality and quantity of light in growing floral plants.	
52.3	Control moisture in growing media and in the greenhouse atmosphere.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 53: The learner will construct a hanging basket.

	Objectives	Measures
53.1	Use flowering plants to make a hanging basket.	Refer to the VEG-AG-C/TIB 7053, p. 75.

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 54: The learner will operate and maintain automatic watering systems, and hand water potted bench and bedgrown crops, according to specified procedures in an equipped greenhouse.

	Objectives	Measures
54.1	Regulate and service an automatic watering system.	Refer to the VEG-AG-C/TIB 7053, p. 76.
54.2	Recognize the difference in water requirements of plants grown in clay, plastic, and peat containers.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 55: The learner will perform leaf-bud, leaf, terminal bud, stem, and root cuttings as methods of propagation, and will prepare the cuttings for rooting.

Objectives		Measures
55.1	Propagate herbaceous flowering plants by leaf bud, leaf, terminal bud, stem, and root cuttings.	Refer to the VEG-AG-C/TIB 7053, p. 77.

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 56: The learner will identify selected flowers, plants, and materials used in floral arrangements.

	Objectives	Measures
56.1	**Identify flowers, plants, and other decorative materials which are used in floral arrangements.**	Refer to the VEG-AG-C/TIB 7053, p. 78.
56.2	Identify accepted principles of floral design.	
56.3	Compare and contrast uses of different plants and materials used in floral design.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 57: The learner will describe different kinds of floral arrangements.

Objectives		Measures
57.1	Sketch the four major floral designs.	Refer to the VEG-AG-C/TIB 7053, p. 79.
57.2	Select construction materials for floral design.	

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AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 58: The learner will identify selected ornamental horticultural plant pests and give recommended control measures.

	Objectives	Measures
58.1	Recognize greenhouse pests and recommend control measures.	Refer to the VEG-AG-C/TIB 7053, pp. 80-81.

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AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 59: The learner will identify selected ornamental horticultural plant diseases and give recommended control measures.

	Objectives	Measures
59.1	Recognize greenhouse plant diseases and recommend control measures.	Refer to the VEG-AG-C/TIB 7053, pp. 82-83.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12

Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 60: The learner will describe a landscape plan and its use.

Objectives	Measures
60.1 Identify occupational opportunities in landscaping.	Refer to the VEG-AG-C/TIB 7053, p. 83.
60.2 Establish and maintain a landscape.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 61: The learner will create a landscape plan for a house and grounds.

Objectives		Measures
61.1	Design and write specifications for a landscape plan.	Refer to the VEG-AG-C/TIB 7053, p. 84.
61.2	Identify proper layout of plant materials in landscaping.	
61.3	Select appropriate landscaping equipment.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 62: The learner will take soil samples and describe uses of the results or findings.

Objectives	Measures
62.1 **Analyze soil test reports and make recommendations.**	Refer to the VEG-AG-C/TIB 7053, p. 85.

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AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 63: The learner will demonstrate the recommended method of watering newly planted landscape plants and trees.

	Objectives	Measures
63.1	Demonstrate the proper method for watering newly-planted trees and shrubs.	Refer to the VEG-AG-C/TIB 7053, p. 86.

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AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 64: The learner will plant different kinds of bulbs.

Objectives	Measures
64.1 Plant bulbs in a landscape appropriately.	Refer to the VEG-AG-C/TIB 7053, p. 87.

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 65: The learner will espalier an ornamental plant.

Objectives	Measures
65.1 Espalier an ornamental plant.	Refer to the VEG-AG-C/TIB 7053, p. 88.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 66: The learner will identify proper methods of maintenance and care of plants after planting.

Objectives		Measures
66.1	Care for newly-planted trees and shrubs.	Refer to the VEG-AG-C/TIB 7053, p. 89.

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 67: The learner will analyze the various accepted principles in growing nursery stock.

	Objectives	Measures
67.1	Compare and contrast accepted principles used in growing nursery stock.	Refer to the VEG-AG-C/TIB 7053, p. 90-91.
67.2	Solve problems associated with growing nursery stock.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 68: The learner will construct a hot bed.

	Objectives	Measures
68.1	Identify various structures used in growing nursery stock.	Refer to the VEG-AG-C/TIB 7053, p. 92.
68.2	Construct and use structures necessary in growing nursery stock.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 69: The learner will plant bare root nursery stock.

	Objectives	Measures
69.1	Demonstrate the procedure for planting bare root plants.	Refer to the VEG-AG-C/TIB 7053, p. 93.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 70: The learner will prepare specimens for mist bed propagation according to recognized criteria using hardwood and softwood stem parts and a knife.

Objectives	Measures
70.1 Make five hardwood cuttings.	Refer to the VEG-AG-C/TIB 7053, p. 94-96.
70.2 Make five softwood cuttings.	
70.3 Demonstrate proper procedures for preparing cuttings for mist bed propagation.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 71: The learner will prepare scion and stock and make a hardwood graft.

Objectives	Measures
71.1 Prepare scion and stock for grafting.	Refer to the VEG-AG-C/TIB 7053, p. 96.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 72: The learner will propagate plants from grafting, using one or more methods including cleft grafting, bench grafting, side grafting, and bark grafting according to recommended procedures, (nursery stock and the necessary tools and materials should be provided).

	Objectives	Measures
72.1	Demonstrate the ability to make five cleft grafts.	Refer to the VEG-AG-C/TIB 7053, p. 97.
72.2	Demonstrate the ability to make five bench grafts.	
72.3	Demonstrate the ability to make one side and bark graft.	
72.4	Demonstrate the ability to correctly use the proper grafting tools.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 73: The learner will propagate plants using the T-bud or shield technique, and care for plants after the budding procedure.

	Objectives	Measures
73.1	Demonstrate the ability to make five T-bud or shield grafts.	Refer to the VEG-AG-C/TIB 7053, p. 98.
73.2	Demonstrate the ability to correctly use the proper building tools.	
73.3	Demonstrate the ability to care for plants after the budding process.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 74: The learner will spray plants properly for sucking insects and for chewing insects.

Objectives		Measures
74.1	Identify plant damage caused by sucking insects.	Refer to the VEG-AG-C/TIB 7053, p. 99.
74.2	Identify plant damage caused by chewing insects.	
74.3	Demonstrate the ability to mix, spray, and properly clean spray devices.	

VOCATIONAL EDUCATION
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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 75: The learner will apply chemicals properly for control of nematodes or other soil pests.

Objectives		Measures
75.1	Recognize plant damage caused by nematodes.	Refer to the VEG-AG-C/TIB 7053, p. 100.
75.2	Recognize plant damage caused by common soil pests.	
75.3	Use the pesticide manual to determine proper spray materials for selected pests.	
75.4	Demonstrate the ability to mix, spray, and clean spray devices.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 76: The learner will identify weeds growing in ornamental plants and will control the weeds using appropriate procedures and processes.

	Objectives	Measures
76.1	Identify common weeds in ornamental crops.	Refer to the VEG-AG-C/TIB 7053, pp. 101-102.
76.2	Use the pesticide manual to select appropriate chemicals for weed control.	
76.3	Demonstrate the ability to mix, spray, and properly clean spray devices.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 77: The learner will determine the type of pest(s) each that pesticide is designed to control using labels from various commonly used pesticides.

	Objectives	Measures
77.1	**Demonstrate the ability to interpret pesticide labels.**	Refer to the VEG-AG-C/TIB 7053, p. 102.
77.2	**Demonstrate the ability to recognize key "signal" words on chemical labels.**	

Grade Level: 10-12   Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 78: The learner will demonstrate safety precautions for handling and mixing a variety of commonly used pesticides.

	Objectives	Measures
78.1	**Demonstrate the ability to safely mix pesticides.**	**Refer to the VEG-AG-C/TIB 7053, p. 103.**

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 79: The learner will demonstrate safe disposal and storage of surplus pesticides and containers.

	Objectives	Measures
79.1	Identify pesticide disposal areas in the home county.	Refer to the VEG-AG-C/TIB 7053, p. 104.
79.2	Discuss the safety procedures to follow when storing surplus pesticides.	
79.3	Discuss the safety procedures to follow when disposing of surplus pesticide containers.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 80: The learner will prepare a schedule of activities for growing mums and poinsettias in a greenhouse.

	Objectives	Measures
80.1	Discuss pertinent points related to the culture of various flowering crops.	Refer to the VEG-AG-C/TIB 7053, p. 105.
80.2	Identify sales dates when given transplant dates.	
80.3	Schedule activities pertinent to chrysanthemum and poinsettias production.	
80.4	Recognize insect damage in flowering crops.	
80.5	Recognize disease damage in flowering crops.	
80.6	Prepare an appropriate soil mixture.	
80.7	Apply appropriate fertilizer materials for flowering crops.	
80.8	Apply appropriate insecticides as needed.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 81: The learner will stratify and scarify seeds in order to improve germination.

	Objectives	Measures
81.1	Describe the various sources where nurserymen can obtain seed to use for seeding as a method of propagation.	Refer to the VEG-AG-C/TIB 7053, p. 106.
81.2	Differentiate between stratification and scarification of seeds.	
81.3	Describe three methods of scarifying seeds.	
81.4	Demonstrate the ability to collect and stratify seeds to be used for future planting.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 82: The learner will arrange a floral design to meet selected criteria.

Objectives		Measures
82.1	Identify various floral designs.	Refer to the VEG-AG-C/TIB 7053, p. 107.
82.2	Recognize live arrangements in floral design.	
82.3	Prepare a floral design as designated by the instructor.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 83: The learner will make a corsage to meet specified criteria.

Objectives		Measures
83.1	Prepare a corsage as directed by the instructor.	Refer to the VEG-AG-C/TIB 7053, p. 108.

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AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 84: The learner will become proficient in the use of plant materials, containers and accessories in making a centerpiece, corsage, floral basket, and a hospital or wedding bouquet.

	Objectives	Measures
84.1	Prepare a centerpiece arrangement.	Refer to the VEG-AG-C/TIB 7053, p. 109.
84.2	Prepare a hospital arrangement.	
84.3	Prepare a floral basket.	
84.4	Prepare a wedding bouquet.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 85: The learner will operate and maintain lighting and shading systems in order to provide optimum conditions for a specific variety of floral crops in an equipped greenhouse.

	Objectives	Measures
85.1	Select dates for long and/or short day floral crop treatments.	Refer to the VEG-AG-C/TIB 7053, p. 110.
85.2	Maintain an appropriate lighting system for flowering plants.	
85.3	Maintain an appropriate shading system for flowering plants.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 86: The learner will identify turfgrasses adapted in North Carolina and the environmental requirements for each.

Objectives		Measures
86.1	Identify turfgrass varieties.	Refer to the VEG-AG-C/TIB 7053, p. 111.
86.2	List environmental requirements for turf grass growth.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 87: The learner will identify the steps in preparing a turfgrass seedbed.

Objectives		Measures
87.1	List the steps necessary in preparing a turf seedbed.	Refer to the VEG-AG-C/TIB 7053, p. 112.

VOCATIONAL EDUCATION
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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 88: The learner will describe several problems involved in establishing and maintaining turfgrasses.

	Objectives	Measures
88.1	Recognize soil texture and structure problems relating to turfgrasses.	Refer to the VEG-AG-C/TIB 7053, pp. 113-114.
88.2	Recognize soil drainage problems relating to turfgrasses.	
88.3	Recognize slope problems relating to turf grasses.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 89: The learner will identify and demonstrate proper use of tools, equipment, and materials in horticulture occupation.

	Objectives	Measures
89.1	Identify tools used in preparing a seedbed.	Refer to the VEG-AG-C/TIB 7053, pp. 115-116.
89.2	Demonstrate the use of hand tools related to seedbed preparation.	

VOCATIONAL EDUCATION
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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 90: The learner will prepare a turf seedbed properly.

Objectives	Measures
90.1 Prepare a turf seedbed.	Refer to the VEG-AG-C/TIB 7053, p. 117.

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 91: The learner will seed a turfgrass correctly.

Objectives	Measures
91.1 Calibrate a seeding device.	Refer to the VEG-AG-C/TIB 7053, p. 118.
91.2 Seed a turf area using a mechanical seeder.	
91.3 Distribute seed uniformly.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 92: The learner will sprig a four feet by four feet area with turfgrass.

Objectives		Measures
92.1	Grid an area in order to obtain uniform spacing.	Refer to the VEG-AG-C/TIB 7053, p. 119.
92.2	Plant a turfgrass stolon properly.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 93: The learner will recognize which available turfgrass varieties are appropriate for use in a specified turf area.

Objectives	Measures
93.1 Identify and list turfgrass varieties for athletic fields.	Refer to the VEG-AG-C/TIB 7053, pp. 120-121
93.2 Identify and list turfgrass varieties for golf fairways.	
93.3 Identify and list turfgrass varieties for golf greens.	
93.4 Identify and list turfgrass varieties for lawns.	
93.5 Identify and list turfgrass varieties for parks.	
93.6 List environmental requirements for growth of turfgrasses in specialized areas.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 94: The learner will prepare a turf seedbed properly by using tiller or tractor-driven equipment.

	Objectives	Measures
94.1	**Demonstrate the safe use of power equipment in seedbed preparation.**	**Refer to the VEG-AG-C/TIB 7053, p. 122.**

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 95: The learner will demonstrate proper seeding procedures for establishing a productive and manageable turf site.

	Objectives	Measures
95.1	**Seed a prepared turf area using recommended procedures.**	Refer to the VEG-AG-C/TIB 7053, p. 123.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 96: The learner will remove sod from established sod producing areas and transplant the sod in a prepared turf site.

Objectives		Measures
96.1	Use a sod cutting machine.	Refer to the VEG-AG-C/TIB 7053, p. 124.
96.2	Adjust a sod cutting machine.	
96.3	Transplant sod to a prepared turf site.	

VOCATIONAL EDUCATION
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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 97: The learner will recognize areas which indicate a need for subsurface drainage in a specific planned turf site.

	Objectives	Measures
97.1	Recognize the need for subsurface drainage when it exists.	Refer to the VEG-AG-C/TIB 7053, p. 125.

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 98: The learner will treat a lawn area for grubs.

Objectives	Measures
98.1 Recognize insect and disease damage in turf areas.	Refer to the VEG-AG-C/TIB 7053, p. 126.
98.2 Use appropriate sources to determine proper treatment materials.	
98.3 Safely mix, spray, and clean spraying devices.	

VOCATIONAL EDUCATION
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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 99: The learner will recognize equipment needed to mow a turf area according to its intended use (e.g., lawn, fairway, golf green).

Objectives		Measures
99.1	Identify turf mowing equipment for lawns.	Refer to the VEG-AG-C/TIB 7053, p. 127.
99.2	Identify turf mowing equipment for golf fairways.	
99.3	Identify turf mowing equipment for golf greens.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 100: The learner will adjust the mowing equipment for cutting height according to the type of turf area to be mowed and manufacturer's recommendations.

	Objectives	Measures
100.1	Describe the proper cutting height for various turfgrasses.	Refer to the VEG-AG-C/TIB 7053, p. 128.
100.2	Adjust mowing equipment to a specified height.	

VOCATIONAL EDUCATION
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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 101: The learner will mow a variety of turf areas and turfgrasses using properly adjusted equipment.

Objectives	Measures
101.1 Mow a turf area as directed by the instructor.	Refer to the VEG-AG-C/TIB 7053, p. 129.
101.2 Demonstrate the safe use of mowing equipment.	

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Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 102: The learner will operate aerifying, thatching and other equipment required in the maintenance of a specific type of turf area.

Objectives	Measures
102.1 Operate an aerifier to the satisfaction of a teacher or an employer.	Refer to the VEG-AG-C/TIB 7053, p. 130.
102.2 Operate a thatcher to the satisfaction of a teacher or an employer.	

VOCATIONAL EDUCATION
AGRICULTURAL EDUCATION

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 103: The learner will recognize the most efficient and economical fertilizers for the turf area and apply the fertilizer and/or lime according to recommended procedures.

Objectives	Measures
103.1 Interpret a soil test report.	Refer to the VEG-AG-C/TIB 7053, p. 131.
103.2 Determine the most economical and efficient fertilizer to apply to a turf.	
103.3 Apply appropriate fertilizer to turfgrass.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 104: The learner will recognize the most appropriate watering equipment to use, considering the turf variety(ies) and the use of the turf area.

Objectives	Measures
104.1 Identify watering devices.	Refer to the VEG-AG-C/TIB 7053, pp. 132-133.
104.2 Recognize the relationship between soil texture, structure, and water requirements of the soil.	
104.3 Select appropriate equipment for applying water to given turf areas.	

Grade Level: 10-12 Skills/Subject Area: Ornamental Horticulture

COMPETENCY GOAL 105: The learner will determine the amount and frequency of watering needed in order to meet the specific turf area's moisture needs.

Objectives	Measures
105.1 Determine the amount of water to apply to turf areas as related to need and usage.	Refer to the VEG-AG-C/TIB 7053, p. 134.
105.2 Determine the amount of water to apply to turf areas as related to climatic conditions.	

APPENDICES

APPENDIX A

House Bill 1567*

A BILL TO BE ENTITLED AN ACT TO ENACT THE ELEMENTARY AND SECONDARY SCHOOL REFORM ACT OF 1984.

The General Assembly of North Carolina enacts:

Section 1. This act may be referred to as the "Elementary and Secondary School Reform Act of 1984."

Section 2. G.S. 115C-81(a) is amended by deleting the first paragraph and substituting the following:

"Standard Course of Study. It is the policy of the State of North Carolina to insure a quality education to every child residing in North Carolina. To this end, the General Assembly directs the State Board of Education to develop a standard course of study to be offered to every child in North Carolina public schools and to submit the proposed standard course of study to the General Assembly by October 15, 1984.

The standard course of study shall reflect a rigorous academic course of study stressing mastery of integrated knowledge based on mastery of competencies in the basic skill areas rather than the study of isolated disciplines. To this end, the State Board of Education is directed to undertake a statewide audit of current curricula and to refine the curricula as required to comply with this policy. The standard course of study:

1. shall stress mastery of integrated knowledge;

2. should provide students with the specific competencies needed to gain employment or to continue their education;

3. should provide students with the skills necessary to cope with contemporary society;

4. shall contain a vocational education component designed to meet the State's and local anticipated career training needs;

5. shall provide for a program of continuous learning based upon the individual child's need, interest, and stages of development, so that the program has a nongraded structure of organization;

6. shall set forth what subjects shall be taught in each grade, and outline the basal and supplementary books on each subject to be used in each grade;

7. shall include a core curriculum for all students plus additional elective curriculum choices to meet the varied needs and interests of students;

8. shall establish a minimum length of the instructional day;

9. shall prescribe standards for student performance and promotion and may consider appropriate levels at which remediation should begin; and

10. shall describe appropriate class size for each course required by the standard course of study; staffing levels to support the standard course of study, and may include minimum staffing for schools, regardless of size, where such schools are determined to be essential to serve pupils located in isolated geographic areas; minimum facility requirements for the standard course of study; minimum material requirements for the standard course of study; and such other information the Board finds necessary to enable the General Assembly to allocate appropriate resources to implement the plan."

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*Includes only that portion of HB 1567 addressed by the Basic Education Program for North Carolina's Public Schools, the North Carolina Standard Course of Study, and the North Carolina Competency-Based Curriculum.

APPENDIX B

16 NCAC 2E.0103; STANDARD COURSE OF STUDY: POLICIES

(a) Definitions. As used in this Rule:

  (1) "Standard Course of Study" means the program of course work for each of the various subjects taught in the elementary and secondary schools of the state, together with competency goals and performance indicators, as defined in (4) and (5) of this subsection, which have been adopted by the state board pursuant to G. S. 115C-81 (a) and subsection (b) of this Rule.
  (2) "Curriculum guide" means a document prepared by the State Department of Public Instruction for each subject or area of study listed in the Standard Course of Study, including suggestions as to suitable instructional aids, textbooks and supplementary resources, learning experiences and teaching methods.
  (3) "Course unit" means a minimum of 150 clock hours of instruction. Short courses will be credited in an amount corresponding to the fractional part of a total unit.
  (4) "Competency goals" means the ends toward which student learning is directed.
  (5) "Performance indicators" means quantitative measures of progress toward competency goals.

(b) The state board shall adopt and periodically review the Standard Course of Study, upon recommendation of the State Superintendent and pursuant to a public hearing and any changes the board deems appropriate. The Standard Course of Study shall be published by the state board. Copies of the Standard Course of Study and the curriculum guides may be obtained from the Department of Public Instruction, 116 W. Edenton Street, Raleigh, N. C. 27611.

(c) The Standard Course of Study shall include, at a minimum, a kindergarten through 12th grade program of studies in the following areas:

  (1) citizenship, including the social studies-economics, history, government, sociology and human relations;
  (2) communications, including foreign languages, educational media, and all phases and applications of English-language arts;
  (3) cultural arts, including the fine and performing arts, recreation and avocations, addressed to both performance and consumer objectives;
  (4) healthful living, including personal and community health, physical education, recreation, and safety;
  (5) mathematics, including computational, problem solving, and consumer skills and substantive advanced elective sequences;
  (6) science, including the basic study of all living and nonliving things as well as advanced elective sequences; and

(7) vocational, including a developmental design, moving from occupational exploration in the middle grades, to selective specialization in the senior high school, as set out in the state Master Plan for vocational education.

(d) The development of subject and course content in the study areas listed in (c) of this Rule shall include, as appropriate for the various grade levels, the study of Americanism, the government of the State of North Carolina, the government of the United States, fire prevention, harmful or illegal drugs including tobacco and alcohol, and the free enterprise system.

(e) The Standard Course of Study shall be implemented in the kindergarten through eighth grades through an appropriate developmental program in each study area for individual pupils. Summer school for these grades is considered an integral part of the regular school term. The Standard Course of Study shall be implemented in the 9th through 12th grades through a program of representative course offerings in each study area.

(f) Graduation Requirements

(1) In addition to the requirements of 16 NCAC 2G.0702, students graduating during or after the 1986-87 school year must successfully complete 20 courses units in grades 9 through 12 to be graduated from high school. These course units must include the following:

(A) four course units in English;
(B) two course units in mathematics;
(C) two course units in social studies; one unit in government and economics, and one unit in United States history;
(D) two course units in science, one unit in a life science or biology, and one unit in one of the physical sciences;
(E) one course unit in physical education and health;
(F) nine course units to be determined by the local education agency. These may be undesignated electives or designated from the study areas described in subsection (c) of this Rule.

(2) Course work successfully completed in the ninth grade at a school system where course units are not awarded in the ninth grade shall be deemed to satisfy the requirements of (1) of this subsection.

(3) Course work successfully completed by students in grades 9 through 12 at a summer school session may be used to satisfy the requirements of (1) of this subsection. Course units so taken shall be earned in the same manner as otherwise provided in this Rule, except that for students repeating courses in summer school the principal shall determine the hours of instruction required to be repeated.

(4) Course work successfully completed by students in grades 9 through 12 at an off-campus institution may be used to satisfy the requirements of (1) of this subsection. No high school may approve enrollment in post-secondary institutions during the regular school year in excess of five percent of its enrollment in grades 10-12 except as approved by the State Board of Education. Enrollment under this policy in community college institutions shall be in accordance with 16 NCAC 2E.0301.

History Note: Statutory Authority G. S. 115C-12(9)c; G. S. 115C-81(a);
Eff. February 1, 1976
Readopted Eff. February 3, 1978;
Amended Eff. April 1, 1983; June 8, 1979

APPENDIX C

COURSE REQUIREMENTS FOR HIGH SCHOOL GRADUATION

Course Units	Subjects
4	English
2	Mathematics
2	Social studies (1 unit in government and economics, 1 unit in United States History)
2	Science (1 unit in a life science or biology, 1 unit in one of the physical sciences)
1	Physical education and health
9	Determined by the local education agency (these may be undesignated electives or designated in the study areas of citizenship, communications, the arts, healthful living, mathematics, science, vocational education)

20 Total Course Units

APPENDIX D

NORTH CAROLINA STATE BOARD OF EDUCATION
NORTH CAROLINA SCHOLARS' PROGRAM

PLAN A

The North Carolina State Board of Education, believing that the success of our State and Nation depends on the full development of our youth and that some students should be encouraged to pursue a well-balanced but more vigorous high school program, institutes a North Carolina Scholars' Program.

Beginning with the 1983-84 school year, students satisfactorily completing requirements as identified by the State Board shall be named North Carolina Scholars and receive special recognition by the State Board.

Course Requirements

Program Area	Units
English	4
Mathematics - Algebra I, Geometry, Algebra II, one beyond Algebra II	4
Science - Biology, Chemistry, Physics (or in lieu of Physics, one other advanced science)	3
Social Studies - U. S. History, Government/Economics, World Cultures (Prior to 1987, U. S. History plus two elective units)	3
Foreign Languages - two levels of the same language	2
Health, P. E.	1
Vocational Education	1
Arts Education	1
Electives - minimum of three	3
	22

Additional Requirement

Students must have an overall four year grade average of B or its equivalent as determined by the local board of education. Equivalency may be determined by numerical grades or weighted grade point averages.

Recognition

1. Students meeting all requirements for a North Carolina Scholars' Program receive from the State Board of Education an appropriate seal of recognition to be affixed to the diploma.

2. Special recognition events should be held in the school and community to honor the students and their parents. These should include appropriate, special recognition at graduation exercises.

3. The State of North Carolina as well as business and industry should consider awarding other special recognitions to these students.

4. Colleges and universities should consider the North Carolina Scholars' achievement when making decisions concerning acceptance by their institutions.

5. An identification of potential candidates for this achievement should be made at the end of grade 11. Candidates would include those students who, after completing their selected senior courses with the designated grade average, would be eligible for recognition. This identification of candidates would reinforce the students' efforts to achieve the recognition and could also be included on their application forms and/or transcripts to colleges and universities.

NORTH CAROLINA STATE BOARD OF EDUCATION
NORTH CAROLINA SCHOLARS' PROGRAM

PLAN B

The North Carolina State Board of Education, believing that the success of our State and Nation depends on the full development of our youth and that some students should be encouraged the pursue a well-balanced but more vigorous high school program, institutes a North Carolina Scholars' Program with concentration in one or more program areas. In order to allow more flexibility in the program, consideration should be given to the optional sequence of courses listed below as an alternative to Plan A.

Beginning with the 1983-84 school year, students satisfactorily completing requirements as identified by the State Board shall be named North Carolina Scholars and receive special recognition by the State Board.

Course Requirements

Program Area	Units
English	4
Mathematics - Algebra I, Geometry, Algebra II	3
Science - Biology, Chemistry, Physics (or in lieu of Physics, one other advanced science)	3
Social Studies - U. S. History, Government/Economics, one additional social studies (Prior to 1987, U. S. History plus two elective units)	3
Foreign Languages - two levels of the same language	2
Health, P. E.	1
Vocational Education	1
Arts Education	1
Electives - minimum of four (concentrations may be selected as listed below)	4
	22

Concentrations

Mathematics - at least one additional advanced unit (balance - 3 electives)

Science - at least one additional advanced unit (balance - 3 electives)

Social Studies - at least one additional unit (balance - 3 electives)

Foreign Languages - at least two additional units of the same language (balance - 2 electives)

Health, P. E. - at least three additional units (balance - 1 elective)

Arts Education - as least three additional units (balance - 1 elective)

Vocational Education - at least three additional units (balance - 1 elective) Three of the minimum four units required for concentration in vocational education must be related to the same vocational objective. Additional units may be related to the same vocational objective or may be in other vocational areas.

Additional Requirement

Students must have an overall four year grade average of B or its equivalent as determined by the local board of education. Equivalency may be determined by numerical grades or weighted grade point averages.

Recognition

1. Students meeting all requirements for a North Carolina Scholars' Program will receive from the State Board of Education an appropriate seal of recognition to be affixed to the diploma.

2. Special recognition events should be held in the school and community to honor the students and their parents. These should include appropriate, special recognition at graduation exercises.

3. The State of North Carolina as well as business and industry should consider awarding other special recognitions to these students.

4. Colleges and universities should consider the North Carolina Scholars' achievement when making decisions concerning acceptance by their institutions.

5. An identification of potential candidates for this achievement should be made at the end of grade 11. Candidates would include those students who, after completing their selected senior courses with the designated grade average, would be eligible for recognition. This identification of candidates would reinforce the students' efforts to achieve the recognition and could also be included on their application forms and/or transcripts to colleges and universities.

APPENDIX E

NORTH CAROLINA COMPETENCY-BASED CURRICULUM

Sample Page

Grade Level: 6 Skills/Subject Area: Social Studies/Knowledge

Competency Goal: 1. The learner will know that ways of living change over time and how and why these changes occur (history).

OBJECTIVES	MEASURES
1.1 Identify changes which have occurred in Europe and/or the Soviet Union.	1.1.1 List changes which have occurred when given an appropriate series of photographs depicting changes in ways of living (dress, housing, work, transportation, and entertainment) in Europe and/or the Soviet Union.
	1.1.2 Draw a picture depicting what s/he believes to be the most significant change to have taken place in Europe or the Soviet Union; describe the picture and explain her/his reasoning aloud to the rest of the class.
1.2 Identify the effect of important changes which have occurred in Europe or the Soviet Union.	1.2.1 Place the examples in chronological order when given appropriately chosen examples of change in Europe or the Soviet Union.
	1.2.2 Match the changes to the resulting effects and identify the country in which each change/effect occurred when given a list of changes and a list of effects.

APPENDIX F

TESTING REQUIREMENTS

Annual Testing Program

The Annual Testing Program consists of standardized tests in reading, language arts, and mathematics administered at grades 1, 2, 3, 6, and 9.* Beginning with science and social studies tests, other skills and subject areas may be added to this program in the future.

Promotion Testing

Phase 1: A student in grades 3, 6, or 8 who scores at or above the 25th percentile (total battery) in the Annual Testing Program meets the State standard for promotion and must them meet local requirements. A student who scores at the 24th percentile or below enters phase two.**

Phase 2: In phase two, a student is tested for mastery of competencies on a test developed by the State Board of Education. Students who demonstrate mastery meet State requirements and then must meet local requirements. Students who do not demonstrate mastery must be retained or attend a State-supported summer remediation program. Students attending the summer program will be assessed to determine whether they have mastered the minimum standards. Those who demonstrate mastery will have met State standards and may be promoted if they have also met local requirements. Those who have not demonstrated mastery will be retained.

End of Course Testing

End of Course Testing is conducted at the secondary level in Algebra I and biology. It is anticipated that up to 20 other courses may be added to this program by the year 1990.

Minimum Competency Testing

Students in grade 11*** are tested for mastery of minimum competencies in the areas of reading and mathematics. In order to graduate from high school, students must receive a passing score on all areas of the Minimum Competency Test.

* It is anticipated that testing will be moved from grade 9 to grade 8.

** The State standard will not apply to students already retained in the same grade span or certified as trainable mentally handicapped, educable mentally handicapped, or severely/profoundly mentally handicapped. Students otherwise handicapped may also be exempted according to standards and procedures developed by the State Board of Education.

*** It is anticipated that testing will be moved from grade 11 to grade 10.

APPENDIX G

TEXTBOOK ADOPTION PROCESS IN NORTH CAROLINA*

The first step in the adoption of basic textbooks is the appointment of a Textbook Commission as set forth in G.S. 115C-87. The law provides that the Textbook Commission shall be composed of fourteen members to be appointed by the Governor upon the recommendation of the State Superintendent of Public Instruction. The law further prescribes that seven of the members shall be outstanding teachers or principals in the elementary school grades, that five shall be outstanding teachers or principals in the high school grades, and that two shall be lay members, one of which shall be the parent of an elementary school student, and one of which shall be the parent of a high school student, with the added proviso that one of the members may be a county or city superintendent.

The State Board of Education authorizes textbook adoptions as set forth in G.S. 115C-85 and 86. The State Superintendent notifies members of the Textbook Commission that there is to be an adoption in a given subject area or areas. The State Superintendent also notifies all registered textbook publishers of the adoption call and invites them to submit any materials they would like to have considered.

Members of the Textbook Commission evaluate all textbooks offered for adoption.

All books submitted are viewed and evaluated within a frame of reference determined by the State course of study. Pursuant to a call and prior to reviewing materials, members of the Textbook Commission and the professional staff of the Department of Public Instruction engage in a thorough overview of the program of studies and develop a concise statement of philosophy, goals, and objectives for the course or subject area under consideration. This statement also reflects any changes or innovations in the program and takes into account current trends and emphases stemming from sound, authoritative research, and experimentation.

In the review and evaluation process each Commission member secures the help of as many advisers as he or she may choose. The number will vary but the usual practice has been for each member to select eight to twelve such advisers. Special expertise in the subject area under consideration is the main criterion in choosing advisers. Each Commission member tries to secure a representative group including classroom teachers, college personnel, supervisory and administrative personnel, and possibly laymen and students.

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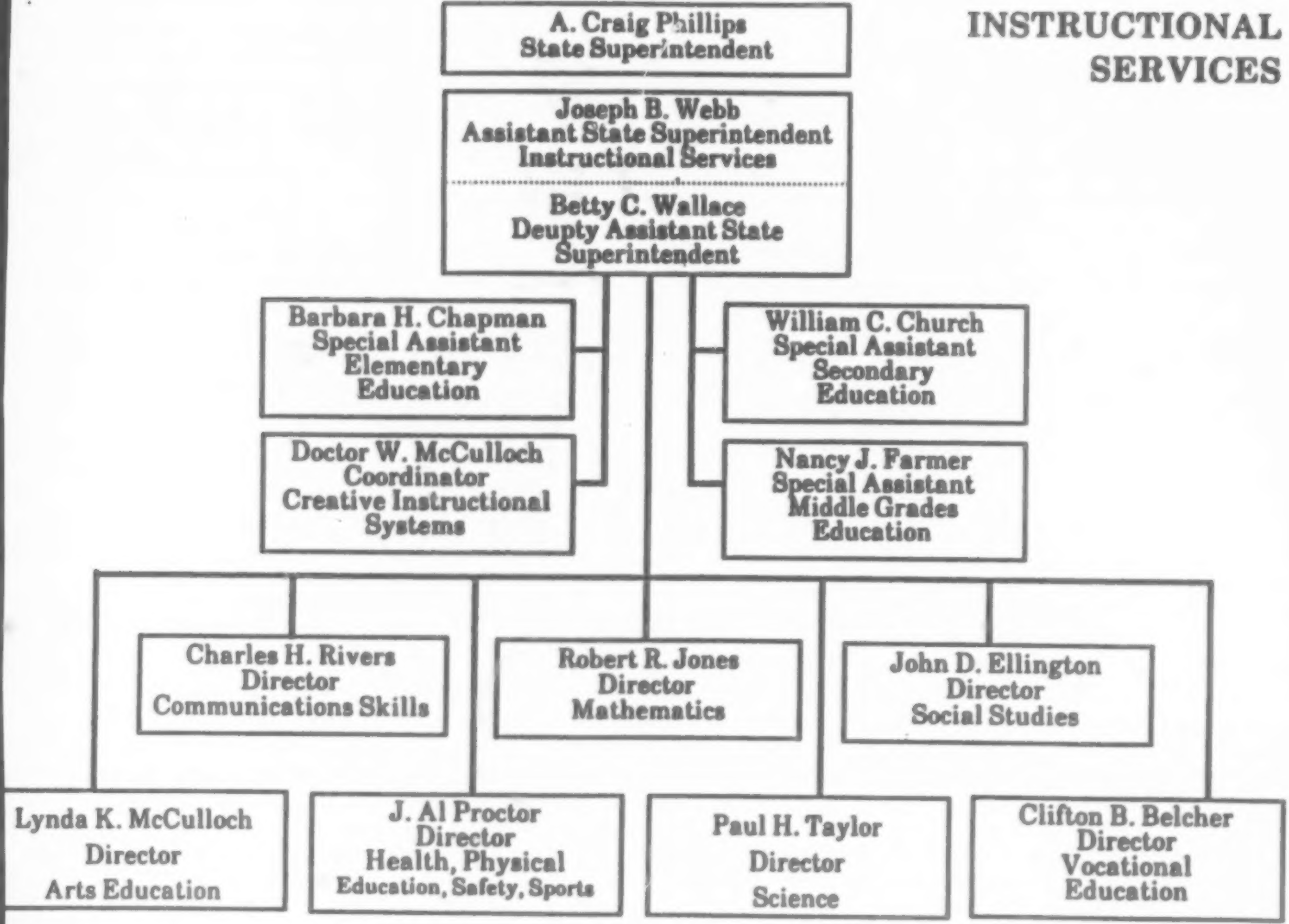
*From North Carolina State Adopted Basic Textbooks 1984-85. Raleigh, NC: Division of Textbooks, Controller's Office, Department of Public Education, 1984.

When the review process is completed, each Commission member files a written evaluation of every book submitted. These evaluation reports must be signed by the member making the report and the Commission Chairman delivers them to the State Superintendent who is also Secretary to the State Board of Education. At the next meeting of the Board of Education, after evaluation reports are filed, the members of the Textbook Commission meet with the Board for joint review and consideration of the reports. In the evaluation of basic textbooks the members of the Commission do not concern themselves in any way with the price of the book or its physical features.

Following the joint session of the Textbook Commission and the State Board to consider the findings and recommendations of the Commission, the State Board officially calls for sealed bids on those books which the Textbook Commission found to be most appropriate for implementing the desired program of instruction in North Carolina schools. Bids are customarily received on five to eight books. At the next meeting or at another designated regular meeting of the Board, the bids are opened and contracts awarded. Where significant differences in the appropriateness of books were noted by the Textbook Commission, the State Board traditionally has placed priority on securing the best materials available.

INSTRUCTIONAL SERVICES


A. Craig Phillips
State Superintendent
Joseph B. Webb
Assistant State Superintendent
Instructional Services
Betty C. Wallace
Deupty Assistant State Superintendent
Barbara H. Chapman
Special Assistant
Elementary Education
Doctor W. McCulloch
Coordinator
Creative Instructional Systems
William C. Church
Special Assistant
Secondary Education
Nancy J. Farmer
Special Assistant
Middle Grades Education
Charles H. Rivers
Director
Communications Skills
Robert R. Jones
Director
Mathematics
John D. Ellington
Director
Social Studies
Lynda K. McCulloch
Director
Arts Education
J. Al Proctor
Director
Health, Physical Education, Safety, Sports
Paul H. Taylor
Director
Science
Clifton B. Belcher
Director
Vocational Education

APPENDIX I

Suggestions for Additions to or Revisions of the

North Carolina Competency-Based Curriculum

1. Suggestion for: A. addition / / B. revision / / (please check one)

2. Skills/Subject Area: ______________________
(e.g., Mathematics, Social Studies, Science)

3. Page Number: ______

4. Addition/Revision to: (please check & give number)

Introduction	/ /	
Competency Goal	/ /	Number: ______
Objective	/ /	Number: ______
Measure	/ /	Number: ______

5. SUGGESTION: ______________________

6. Name of person submitting suggestion: ______________________
Place of employment: ______________________
Employed as: ______________________
Address: ______________________

Please return this form to: Joseph B. Webb
Assistant State Superintendent
for Instructional Services
Education Building, Raleigh, NC 27611

"END OF DOCUMENT"